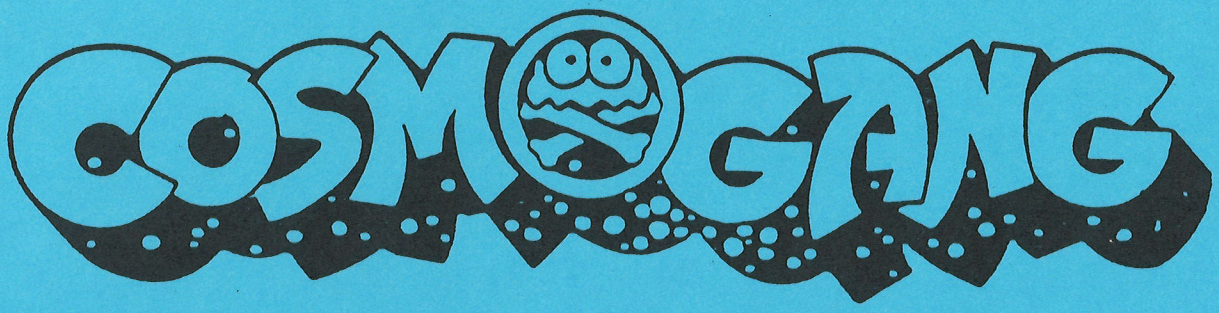


DATA EAST USA, INC.
1850 Little Orchard Street
San Jose, California 95125
Telephone (408) 286-7080

780-0183-00
Feb. 1991

SAFETY NOTICES

The following safety hints apply to all game operators and service personnel. Specific warnings will be found throughout this manual where they apply.

AC POWER CONNECTION

Before connecting the game to the AC power source, verify that the game's power supply is properly configured for the line voltage at your location. To avoid electrical shock, disconnect the game from the power source before removing or repairing any part of the game. When removing or repairing the XENON PCB, XENON Lamp or XENON Gun, extra precautions must be taken to avoid electrical shock because high voltages may exist within the XENON PCB.

USE THE PROPER FUSES.

To avoid electrical shock use the replacement fuses which are specified on the labels which are attached under the fuse holders or printed on the PCB.

GAME POWER SPECIFICATIONS:

POWER

Voltage	115V AC @ 60 Hz
Power Consumption	600W 5.0 AMPS
Temperature	0 to 40 C

MEASUREMENT

Width	37"
Length with seat frame	126 1/2" In normal game mode
Length without seat frame	99"
Height	71"
Weight crated	1060 lbs
Weight without crate	825 lbs

SETUP PROCEDURE

1. Remove the game from its shipping crate and inspect the exterior of the cabinet for any signs of damage or broken parts.

2. Unwrap the seats and examine for any damage.

3. The keys which are attached to the Gun pipe will open the Coin Door. Once the Coin Door has been opened, the keys to the control panel, access door and rear door can be obtained.

4. Ensure that all connectors on the cabinet harnesses are plugged in firmly.

5. Ensure that all plug-in integrated circuits on each PCB are firmly seated in their sockets.

6. Inspect the power cord for any cuts or dents in the insulation. Make sure that the fish paper covers the fuses and correct fuses are installed.

7. Line Voltage: **COSMOGANG** leaves the factory installed with 115v AC @ 60 Hz power requirements.

8. To bolt the seat frame to the cabinet, underneath the front cabinet, pull the seats away from the front cabinet and tilt the game on one side. **Bolts are in the cash box.**

9. Plug the power cord into a grounded, 3 terminal, AC outlet.

10. Turn the **ON/OFF** switch to the **ON** position. The power switch is located on the bottom right hand corner on the back of the game.

CAUTION!!!

When transporting or moving the game, be sure to separate the cabinet from the Gun Console. Do not drop or shake the unit.

This game is designed for indoor use only. Install the game on a solid level surface with no floor vibration away from direct sunlight. Keep game away from dust and moisture and heating outlets.

Do not place the game near fire equipment or emergency exits.

Do not attempt to repair the Game PCB. Return it to your distributor for repairs. The board contains sensitive chips which could be destroyed even by the internal voltage of a multi-meter.

Be careful that players, especially children do not interfere with the characters movements or attempt to reach beyond the side rails. Hands and fingers could be caught causing injury.,

To prevent mischief, this game is designed to stop giving credits if the coin switch is closed longer than the normal coin passage time.

GAME DESCRIPTION

COSMOGANG is a comical shooting game which can be enjoyed by all ages.

When coins are dropped into either coin slot, the 1 Player or 2 Player Lamps will illuminate, the number of Players will be automatically chosen, depending upon the number of coins dropped into the coin slot. The Player must then select the "EASY" or "HARD" course. Refer to Dip Switch setting.

The Cosmos will come out from under the spaceship and move toward the front of the playfield and try to steal the Energy Cubes. The object of the game is for the Player to use the Laser Gun to shoot at the target inside the CHARACTER'S mouth and defend the Energy Cubes from theft. If the Player hits the target while the CHARACTERS are moving forward or moving backward with the Energy Cube, that CHARACTER will have to return to the spaceship without the Energy Cube. Each time you successfully shoot the target, a "point" is registered on the display panel. If any one particular Energy Cube is taken by a CHARACTER to the spaceship, the light above that CHARACTER will flash and the game will then be over.

LIGHT PANEL

There are 5 different light panels on the **COSMOGANG** game:

1. WIN Lamp (Yellow Amber): will flash ON/OFF when you win the game. It will also flash **ON/OFF** every 4 to 5 minutes after the instructions of Cosmo's BOSS during the game mode.

2. COSMO Lamps: There are 5 Lamps on this panel which are above the individual CHARACTERS. These Lamps always light up when the game is NOT in the play mode. After the game has started, these Lamps get dimmer during game play until any CHARACTER takes the Energy Cube successfully back to the spaceship, the Lamp above the successful CHARACTER will flash.

3. WING Lamp (Red Lens): These Lamps flash on and off when the game is **ON**.

4. UFO Lamp (8 Lamps): These Lamps are located inside the Dome and always flash **ON** and **OFF** sequentially from left to right and from right to left.

5. BOSS SPOT Lamp (3 Lamps); These Lamps are illuminated when the power is **ON**.

6. CONTROL PANEL Lamps: There are 4 Lamps on the control panel.
   A. 1 Player Lamp: Illuminates when you insert a coin.
      ONLY THE LEFT GUN WILL BE ACTIVATED
   B. 2 Players Lamp: Illuminates when you insert more than one coin.
      BOTH GUNS WILL BE ACTIVATED
   C. **EASY** Lamp: Illuminates when you insert one or more coins.
   D. **HARD** Lamp: Illuminates when you insert one or more coins.

There are two different types of Lamps used on the game:
   A. The #89 Lamps - Boss spot
   B. Miniature Lamps - Wing

There are 2 courses: **EASY** and **HARD** - The Player has an option to either play EASY or HARD by pushing the appropriate button.

LIGHT PANEL (continued)

** The **EASY** course has two stages:

- Stage 1 : You have 40 seconds to defend your Energy Cube from theft.
- Stage 2 : You have an additional 20 seconds to complete and win the battle.

** The **HARD** course has three stages.

- Stage 1: You have 40 seconds to defend your Energy Cube from theft.
- Stage 2: You have 30 seconds to defend your Energy Cube from theft before advancing to stage 3.
- Stage 3: Defend your Energy Cube for 20 more seconds and you win.

SERVICE PANEL FUNCTIONS

The Service Panel is located inside the Coin Door assembly and includes the following:

COIN COUNTER: Increments 1 for each coin dropped through either coin slot.

VOLUME CONTROL: Adjusts the overall loudness of the game's sound effects. This control is preset for mid-range at the factory.

SERVICE SWITCH: The upper switch on the service panel can be used to start the game without incrementing the coin counter.

TEST SWITCH: The lower switch on the service panel is used to activate the **TEST MODE** of the game.

TEST MODE

There are two buttons on the service panel. The upper button, RED, is the SERVICE switch which allows credits to be in stalled in the game without registration of the coin counter. The lower button (BLACK) is the "**TEST**" switch.

To enter the **TEST** mode do the following:

1. **SOLENOID TEST** - Push the TEST button. Check each CHARACTER and Energy Cube and Lockout Coil ,on the coin mech, for coil activation:
   A. Every CHARACTER's head should rock back and forth.
   B. Every Energy Box Lock should open and close.
   C. The Lockout Coil in the Coin door mech should open and close.

2. **LAMP TEST** - Push the GREEN button on the control panel once for testing the following Lamps. These Lamps should flash **ON/OFF.** Check for:
   A. Wing - RED - Lamp - 2
   B. Boss Spot Lamp - 2
   C. Dome Lamp - 8
   D. COSMO Lamp - 5
   E. Win Lamp - 2
   F. Control Panel Lamp:
      a. 1 Player and 2 Players Lamp - 2
      b. EASY/HARD Lamp - 2
   G. LED - 3 stages - on Display Board

3. **XENON LAMP TEST** Push the GREEN button and check for the following:
   A. XENON Tube - Left - flashes
   B. Gun - Left - flashes
   C. XENON Tube - Right - flashes
   D. Gun - Right - flashes
   E. Last LED on the Display PCB shows: 0

4. **PHOTO TRANSISTOR TEST** - While Guns are flashing, aim the left Gun at CHARACTER #1's mouth. The Display PCB should show the following:

TEST MODE (Continued)

A. Last LED digit indicates: number of hits - from 0 to 9.
B. The third LED from the right indicates which CHARACTER you aimed at.
   * Photo Transistor #1 - 5

C. Repeat with Right Gun
   After 1 minute this test will end and go to the next test automatically.

5. **LED TEST** - Push the GREEN button, check for:
   A.. 7 LED segments on the Display PCB will display from 0 to 9.

6. **TRIGGER SWITCH TEST** - Press GREEN button and check:
   A. Press Left gun's trigger: Voice should say **OK**
   B. Press Right gun's Trigger: Voice should say **OK**

7. **SOUND TEST AND MUSIC TEST** - Press GREEN button: The game should cycle through all sounds and automatically cycle through music.

8. **DRIVE UNIT TEST** - When the music test is finished, Character #1 to #5 will come out and drag an Energy Cube back to the spaceship, then push it back to the front and return to the spaceship.
   A. Character and Energy Cube #1 - #5

NOTE - CHARACTERS ARE COUNTED FROM LEFT TO RIGHT.

9. **READY MODE** - Push the GREEN button for the last time, it should reset to the Game Mode - Ready Mode - which means the Display PCB will show:
   Time - 10 seconds
   Hit - 20 points:
   High Score 1 Player - 30 points
   High Score 2 Players - 45 points

OPTION SWITCH SETTINGS

The **COSMOGANG** game allows operators to adjust the pricing, ticketing, difficulty, etc.

Two locations allow access to these dipswitch banks:

a) An 8 position dipswitch is located on the upper part of the Main CPU between the J9-J5 connector.

b) A 4 position dipswitch is located next to the 6 position dipswitch on the CPU.

DIPSWITCH POSITIONS

***NOTE - CHECK ALL DIPSWITCH SETTINGS BEFORE OPERATING.**

MAKE CERTAIN THAT GAME IS TURNED OFF BEFORE CHANGING DIPSWITCH POSITIONS

TABLE 1

DIPSWITCH 2

4 POSITIONS

		1	2	3	4
Game Difficulties	Easy	OFF	OFF		
		ON	OFF		
	Hard	OFF	ON		
		ON	ON		
	Coin Mode			OFF	
	Free Play			ON	
Ticket	YES				OFF
	NO				ON

TABLE 1

DIPSWITCH 1

8 POSITIONS

		1	2	3	4	5	6	7	8
Game Charge	1 coin = 1 player	OFF	OFF					N	N
	1 coin = 2 player	ON	OFF					O	O
	2 coin = 1 player	OFF	ON					T	T
	3 coin = 1 player	ON	ON						
Attract Play	Yes			OFF				U	U
	No			ON				S	S
Game Charge (Left) Coin 2	1 ticket for every 5 points				OFF	OFF		E	E
								D	D
	1 ticket for every 10 points				ON	OFF			
	1 ticket for every 15 points				OFF	ON			
	1 ticket for every 20 points				ON	ON			
Ticket	Ticket					OFF			

TABLE 3

DIPSWITCH 3

6 POSITIONS

FROM LEFT TO RIGHT	1	2	3	4	5	6
	ON					N
Character #1		ON				O
Character #2			ON			T
Character #3				ON		U
Character #4					ON	S
Characgter #5						E
						D

MAINTENANCE

NOTE - CHARACTERS AND DRIVE UNITS ARE COUNTED FROM LEFT TO RIGHT.

Make certain that the power supply is turned **OFF** before any disassembly is attempted.

A. Replacing the Drive Unit Assembly and Motor.

1. Loosen the 11 button-head screws that hold the plex and side grates together.
2. Loosen one #5/16 bolt which holds the grate and top cabinet together.
3. Remove the side grate. In order to save time, we recommend you remove one side grate only if you know specifically which Drive Unit or CHARACTER is defective.
4. Loosen 2 button head screws. Push the 5 Energy Cube about 6 inches back toward the CHARACTERS and remove the blue energy divider panel.
5. Lift the playfield panel, one side, up and pull it out toward the Guns.
6. Loosen two #1/4-20 bolts on the motor side and loosen 2 or 3 bolts on the bracket that holds the Drive Unit on the opposite end. **You do not have to remove the bolts and bracket; simply loosen them.**
7. Remove all 7 connectors of that particular Drive Unit.
8. Move the CHARACTER toward the front.
9. Push the Drive Unit off the plate bracket and remove the Drive Unit.

B. **Replacing the Roller Bearing of the Energy and Character Carriers.**

1. Repeat procedures 1 through 9 in part A.

MAINTENANCE (continued)

2. If you want to replace the rollers on the Energy Cube, remove the bracket at the small pulley end of the Drive Unit. Slide the Energy Cube off the Drive Unit. If you want to replace the CHARACTER's rollers; remove the bracket at the motor end and loosen the cable on the CHARACTER, slide it off the Drive Unit.

C. Replacing the Character and Character's Components

1. Repeat procedures 1 through 5 in part A.

2. Move the CHARACTER to the middle of the rail. Remove the 6-pin connector and one ring terminal. Use an 11 x 32 nut driver to loosen 2 nuts behind the CHARACTER's body. Slide CHARACTER off his carrier frame.

NOTE: Photo transistor is located inside CHARACTER's mouth.

D. Replacing the Sensor PCB, Front and Back, of the Drive Unit.

1. Repeat procedures 1 through 8 in part A.

E. Replacing Sensor PCB from middle Drive Unit and Energy Cube.

1. Repeat procedures 1 through 4 in part A.

F. Replacing the light bulbs of the Dome and Boss Character.

1. Loosen 5 of the #10-24 bolts on top of the UFO (A).

2. Lift the Dome up and remove two 2-pin connectors off the red wing lens.

3. Remove the UFO (A).

G. Replacing the Gun Assembly.

1. Remove Gun cover with an Allen wrench. Loosen three #12-24 socket hex-head bolts.

MAINTENANCE (continued)

2. Unlock and lift the control panel.

3. Disconnect the 2-pin connector which is attached to the Gun.

4. Remove the XENON Tube cover and remove the fiber cable from the tube. **NOTE: MAKE SURE THE FIBER CAP IS LINED UP AND <u>CLOSE</u> TO THE XENON TUBE WHEN YOU REASSEMBLE.**

5. Loosen a 1/4-20 socket hex head bolt and remove the washer, spacer and the pin from the Gun shaft.

6. Pull the Gun off the Gun base brackets.

H. Replacing the CHARACTER Lamps

1. Loosen four flat wood screws behind the top box.

2. Remove the door. Replace the Lamps.

I. Removal of the Speakers and Display PCB

1. Unlock and lift the Control Panel.

2. Disconnect the 2-pin connector on the speaker harness

3. Remove the Display Panel Plex.

4. Lift and remove the Speaker Panel off the bracket.

J. Replacing the Power XENON PCBs

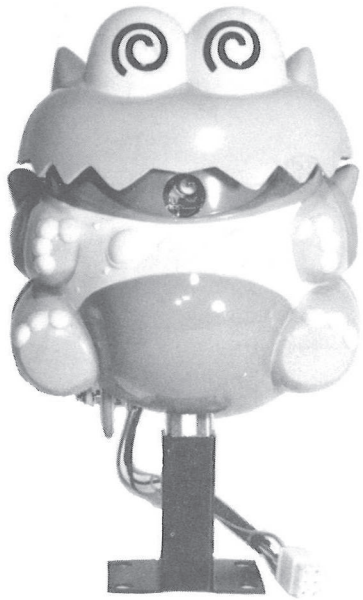
1. Loosen the screw that holds the XENON PCB cover.

2. Disconnect the 3-pin and 4-pin connectors on each board. Slide them out from the slot. Remember, the Upper PCB is used for the Right Gun, the Lower PCB is used for the Left Gun.

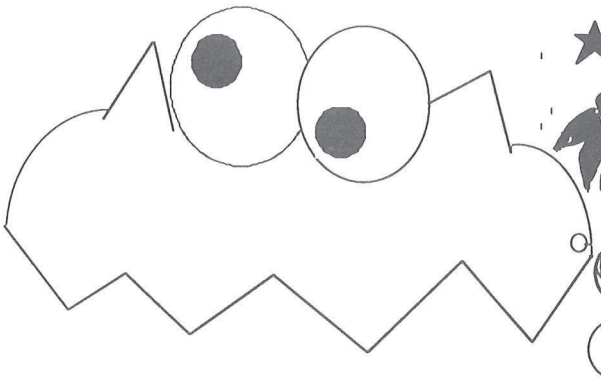
CHARACTER ASSEMBLY

REF #	PART # DATA EAST	DESCRIPTION	
1A	545-0030-01	Character 1 head	Crescent Eyes
1B	545-0030-02	Character 2 head	Rolling Eyes
1C	545-0030-03	Character 3 head	Starred Eyes
1D	545-0030-04	Character 4 head	Crossed Eyes
1E	545-0030-05	Character 5 Head	Spiral Eyes
1F	545-0030-06	Boss Character Head	
2	545-0024-00	Character Front	Front Body, Bottom Section, Plastic
*	545-0025-00	Character Rear	Rear Body, Bottom Section, Plastic
4	260-0006-00	Roller	1" Diam.Nylon Roller at bottom of Head Rocker Bracket
6	530-0034-00	Shaft B	5/8" holds Nylon Roller to Ball Link
7	530-0035-00	Shaft E	1/2" holds Nylon Roller to Rocker Arm
8	530-0036-00	Shaft F	2 1/8" Through center of Head Rocker Bracket
9	530-0037-00	Shaft H	4 3/8" Shaft inside Cosmo Head
10	530-0038-00	Shaft	1 7/8" Shaft attached to plunger assembly
12	325-0005-00	Link	Attaches to Plumger
16	325-0006-00	Ball Link Arm	Connects Roller and Head Rocker Frame
18	265-0003-00	Spring	1" Spring connecting pcb & solenoid mounting bracket
19	315-0002-00	O Ring for roller	1 1/4" Rubber Ring for 1" Nylon Roller
20	280-0013-00	Bushing	3/16" long, 3/8" OD on F & B of Rocker Arm Bracket
21	280-0014-00	Bushing	5/32" long 5/16 OD on R & L side of Rocker Arm Bracket
*	520-0108-00	Photo Coupler PCB	
23	090-0004-00	Solenoid	
25	545-0036-00	Boss Antenna	Green Antenna on Boss Head
*	160-0008-00	Photo Transistor	Located on Photo Coupler PCB
*	280-0016-00	Well Nut	Located in Boss Character Head
*	251-0005-01	Roll Pin	Connects Link and Plunger Assembly 1/2"long x 1/8

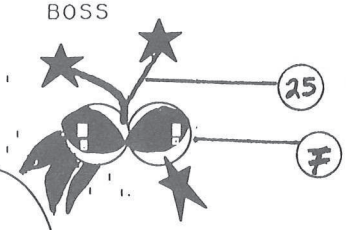
* DESIGNATES NOT SHOWN

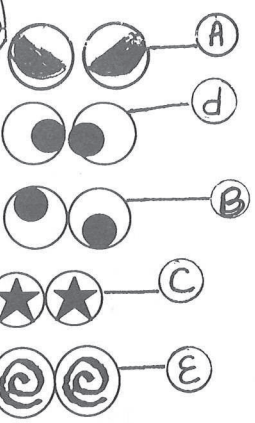


CHARACTER TOP HEAD



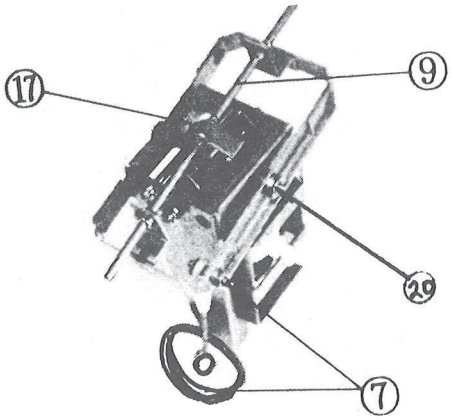
BOSS

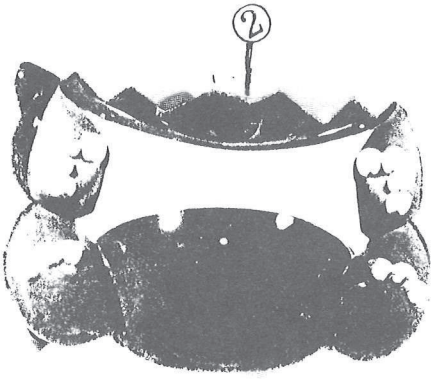


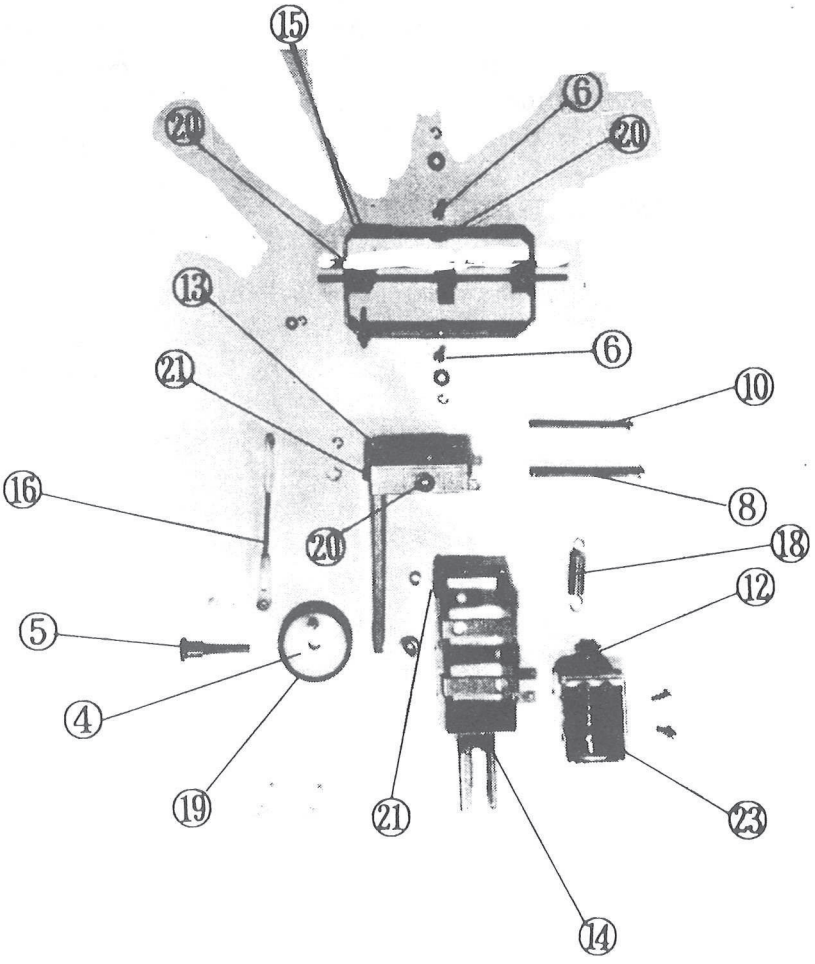


NOTE: EYE STYLE DESIGNATES PART NUMBER FOR TOP CHARACTER HEAD.

ALL STYLES MAY NOT BE AVAILABLE. SUBSTITUTION WILL BE MADE IF NECESSARY.

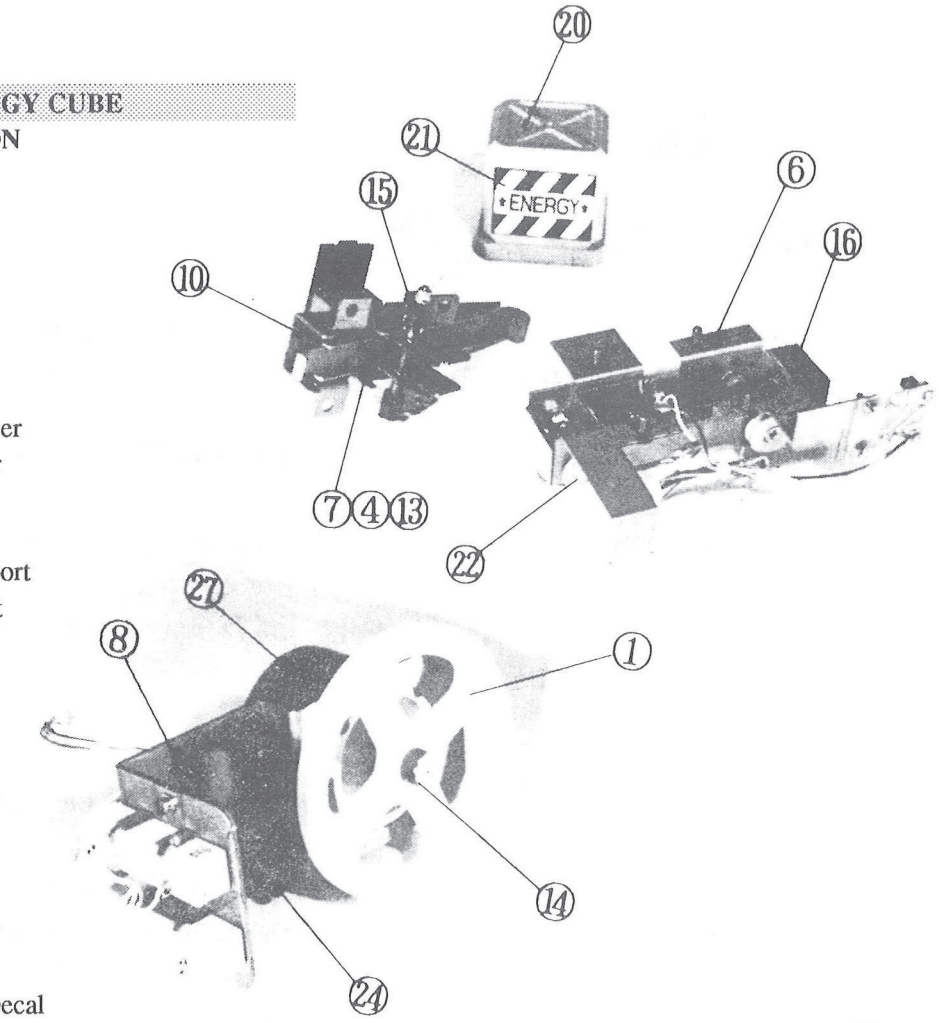


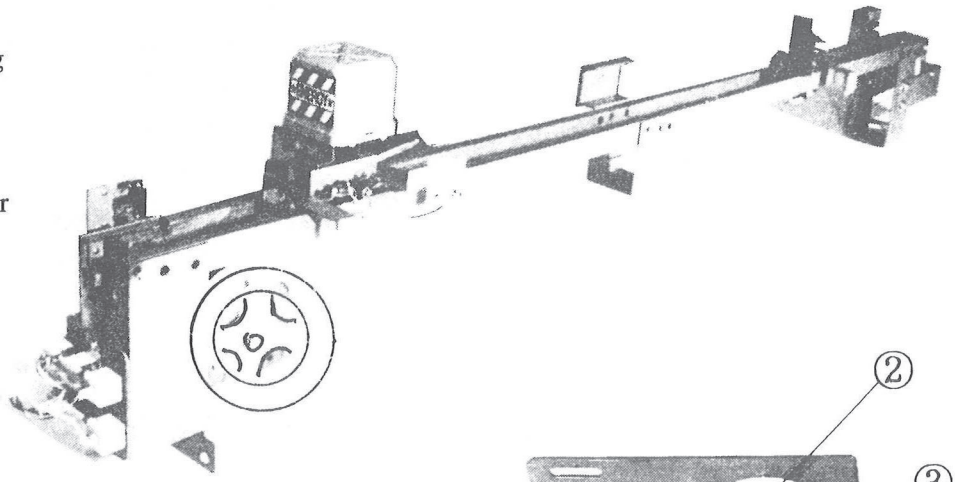


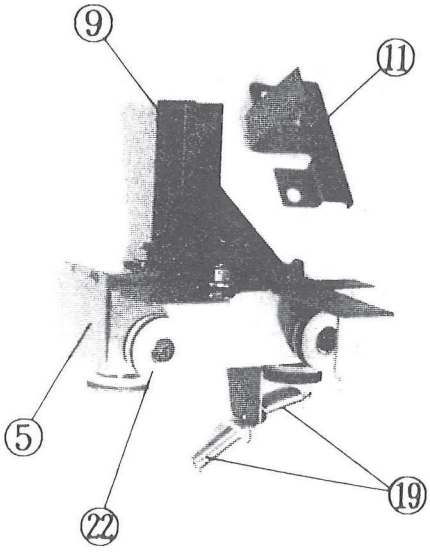


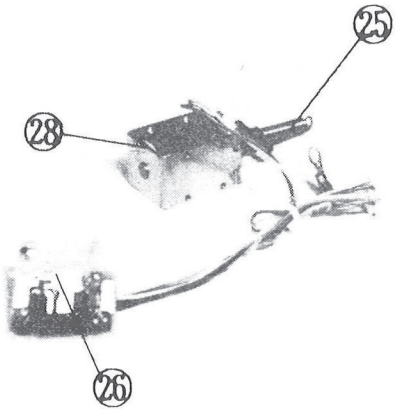
DRIVE ASSEMBLY & ENERGY CUBE

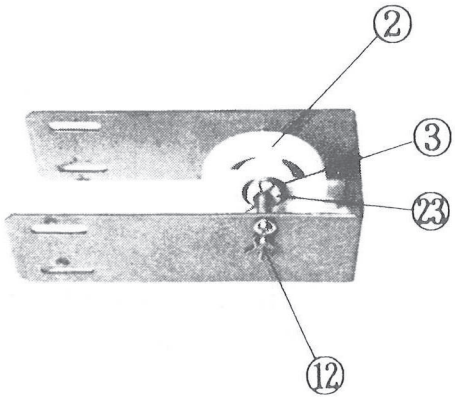
	PART #	DESCRIPTION
	DATA EAST	
1	305-0001-00	Pulley A
2	305-0001-02	Pulley B
*	285-0007-00	Arm Stopper
*	260-0007-00	Bearing
3	244-103	Spacer
4	244-104	Arm Bushing
5	535-0175-00	Character Carrier
6	535-0176-00	Energy Carrier
7	244-107	Lock Arm
8	244-108	Motor Bracket
9	244-109	Character Support
10	244-110	Energy Bracket
11	244-111	Harness Cover
12	244-112	Pulley Shaft
13	244-113	Arm Shaft
14	244-114	Boss Pulley
15	244-115	Arm Ítopper
16	244-116	Cushion A
17	244-117	Cushion B
18	315-0001-00	Steel Cable
19	244-119	Tension Spring
20	545-0016-00	Energy Cube
21	244-121	Energy Cube Decal
22	235-057	Bearing
23	244-122	Flange Bearing
24	235-029	Wellnut
25	244-123	Spring
26	235-017	Sensor PCB
27	244-124	Stepping Motor
28	244-025	Solenoid

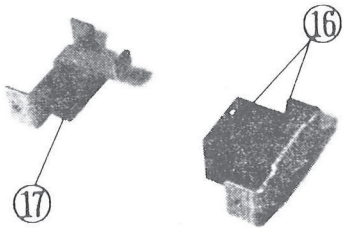












*NOTE-ALL 6 DIGIT PART NUMBERS XXX-XXX ARE PRELIMINARY

ERROR CODE

If a problem occurs during the game play, an error message code will be displayed in one or more windows on the back glass. Trouble shooting hints are described below:

ERROR CODE	POSSIBLE TROUBLE
Every window shows 1	Check the J6 - J87 and J86 harnesses. Make sure signals from the 6-pin connector - B18,A19,A20 of J86 are grounded.
2 Players window high score shows #111	Character #1 cannot drag the Energy Cube back to spaceship. a) Check fuse F3 on the Fuse PCB b) Check connectors of Energy Cube and motor on #1 c) Measure voltages of the Energy Cube #1 d) Check the coil inside the Energy Carrier. Use the DRIVE UNIT TEST to check. e) If Character #1 is able to drag the Energy Cube to the spaceship but did not push the Energy Cube to the front, check the back Sensor PCB.

Using the same criteria, check the following CHARACTERS, Fuse PCB and Energy Cube.

2 Players window - high score shows 222	Character #2 - Fuse F4
2 Players window - high score shows 333	Character #3 - Fuse F5
2 Players window - high score shows 444	Character #4 - Fuse F6
2 Players window - high score shows 555	Character #5 - Fuse F7

ERROR CODE (continued)

2 Players window
high score window shows #101

Character #1 cannot push the Energy Cube back to the front:

a) Check connectors of Energy Cube #1
b) Measure the voltage of Energy Cube and Front Sensor PCB of #1.
c) Turn game ON/OFF; if motor #1 is shaking while CHARACTER cannot push Energy Cube forward; repair or replace the motor.
d) If the Energy Cube #1 opens and closes the latch and Energy Cube is at its position which means the latch is already locked in the front hook, check the Front Sensor PCB: repair or replace front Sensor.

Using the same criteria, check the following CHARACTERS:

2 Players high score window shows #102	Character #2
2 Players high score window shows #103	Character #3
2 Players high score window shows #104	Character #4
2 Players high score window shows #105	Character #5

ERROR CODE (continued)

If CHARACTER gets back to the spaceship while the motor is running:

2 Player's score window shows 201 - Character #1

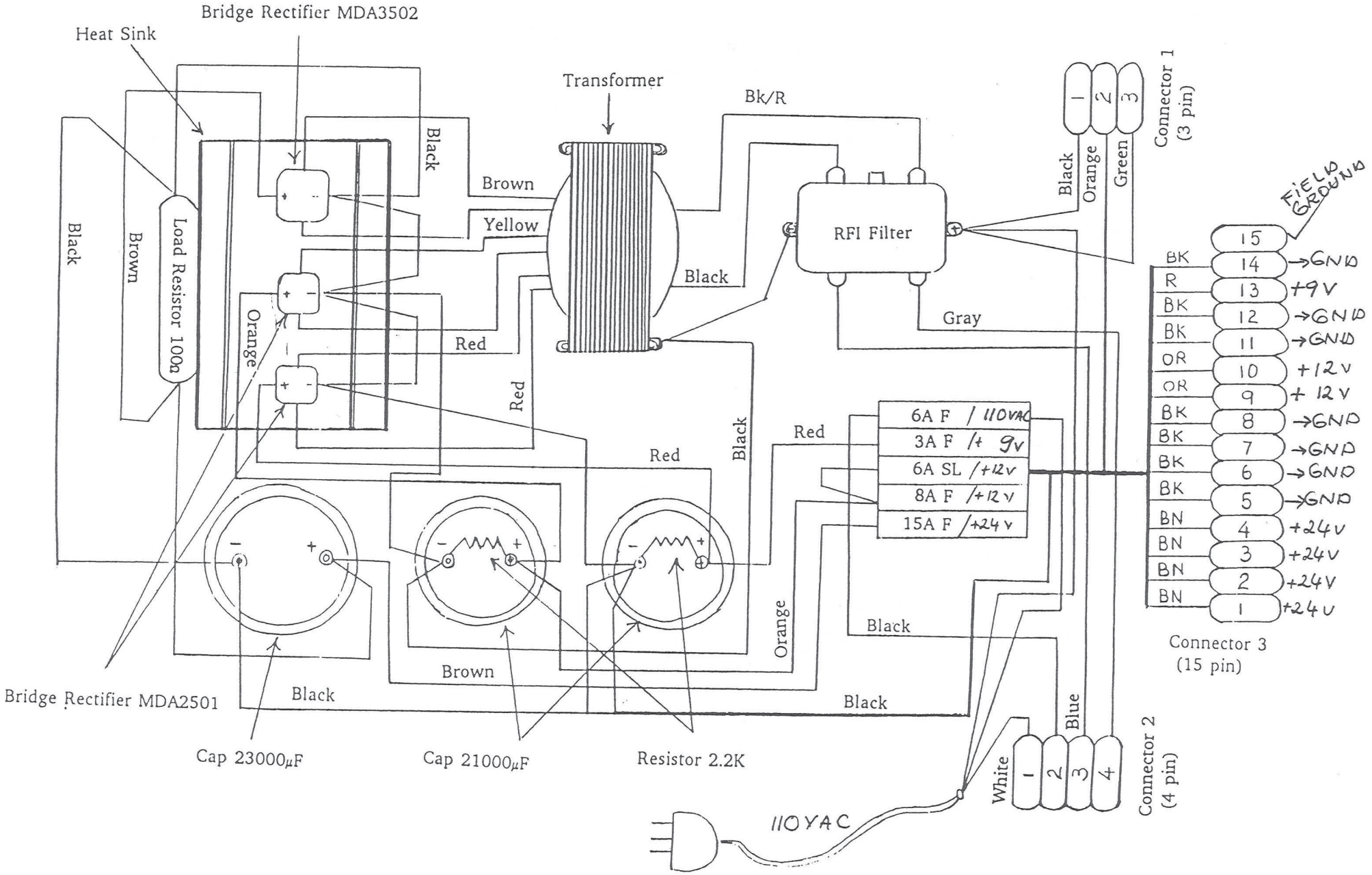
a) Check the back Sensor PCB on the CHARACTER, repair or replace Sensor PCB.

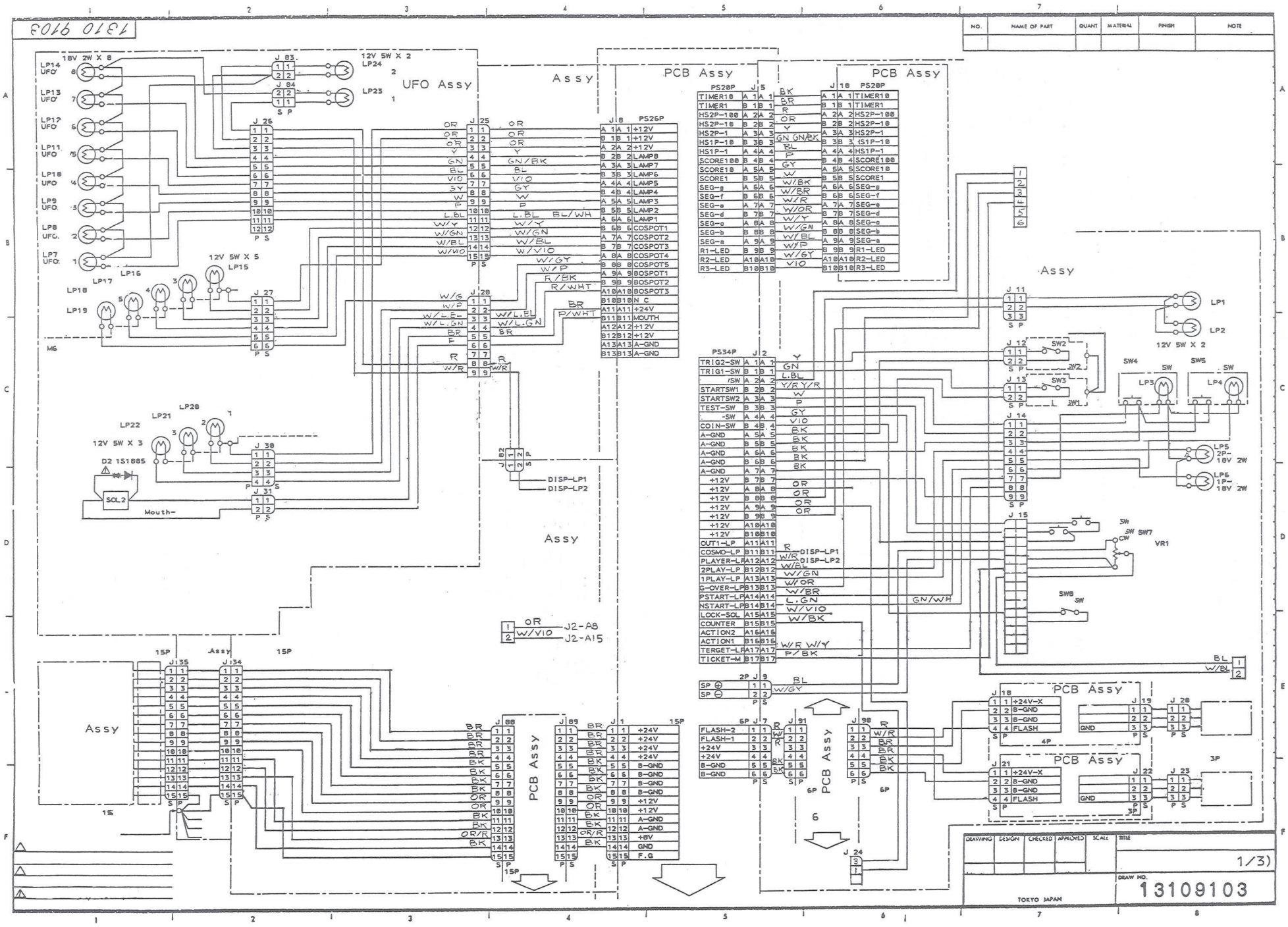
Using the same criteria, check the following CHARACTERS:

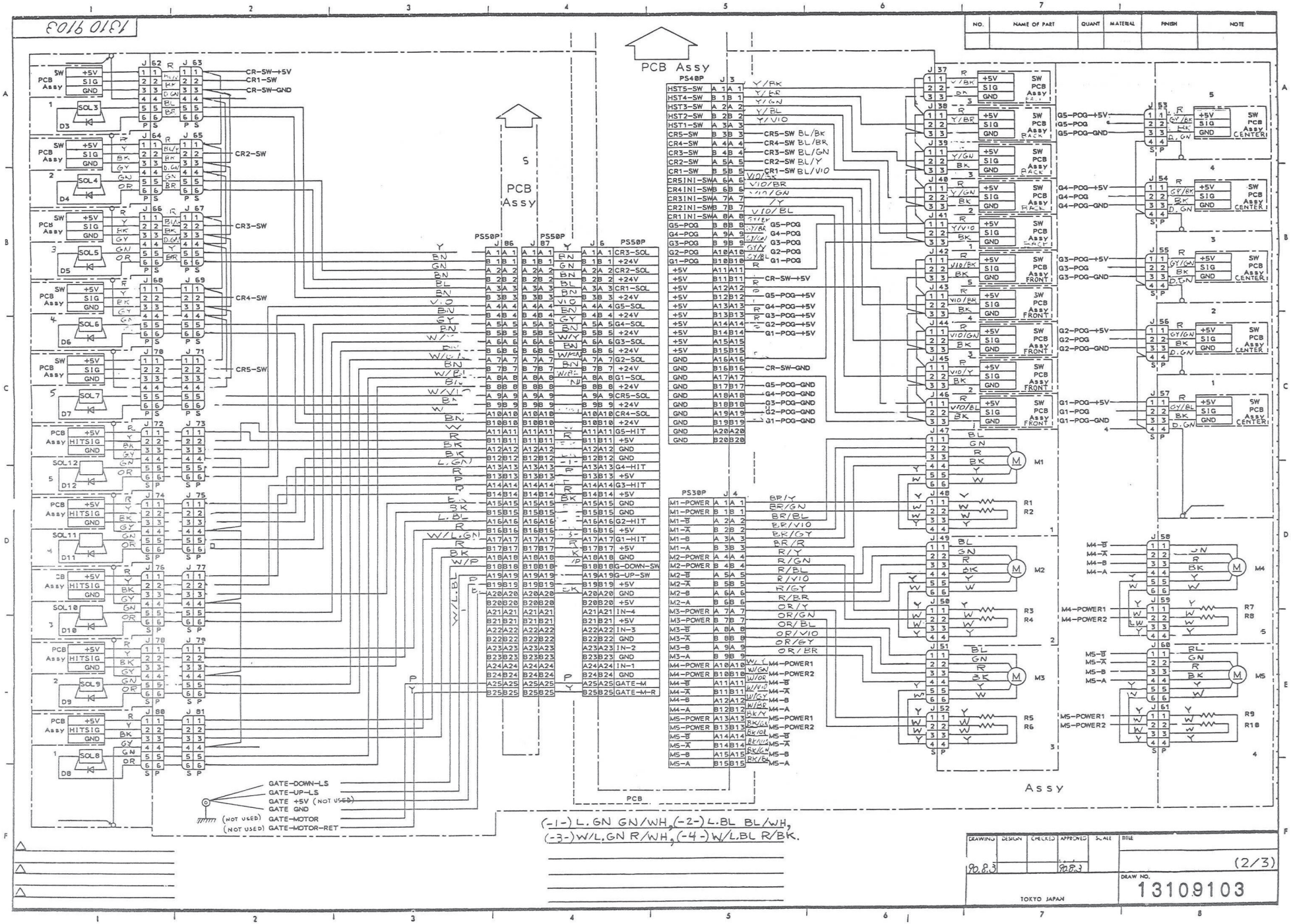
2 Players score window shows 202 - Character #2
2 Players score window shows 203 - Character #3
2 Players score window shows 204 - Character #4
2 Players score window shows 205 - Character #5

If any CHARACTER has trouble and you still want the game to operate temporarily, you can isolate that CHARACTER by using the dipswitch settings, 6 positions. After you change the dipswitch setting, turn the power **ON**; the last LED of 2 Players score will flash **ON/OFF** displaying the CHARACTER number you isolated for a few seconds and then reset to game mode. It is not recommended that you operate a game which has 2 or more non-operative CHARACTERS.

Power Supply Assembly

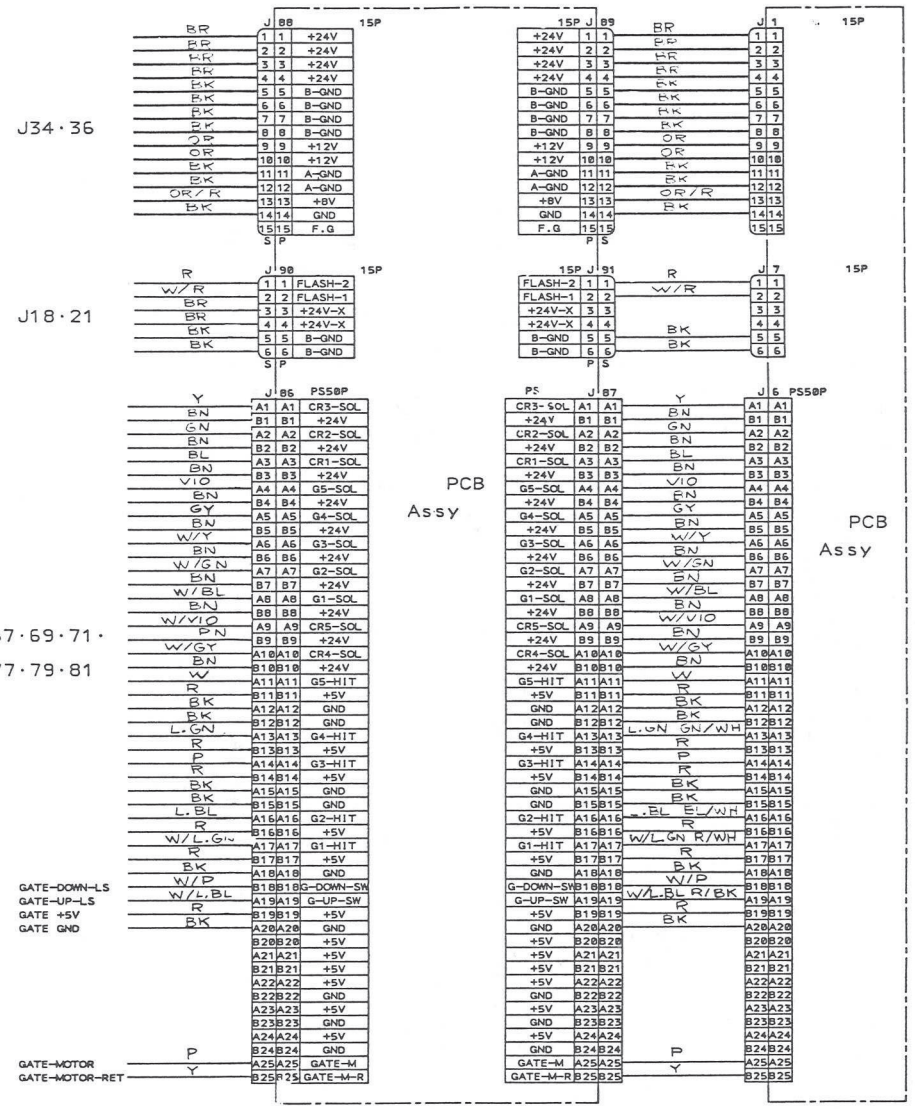



1310 9103
UFO Assy
PCB Assy
PCB Assy
PCB Assy
Assy
Assy
Assy
Assy
Assy
18V 2W X 8
LP14 UFO 6
LP13 UFO 7
LP17 UFO 6
LP11 UFO 5
LP10 UFO 4
LP9 UFO 3
LP8 UFO 2
LP7 UFO 1
12V 5W X 2
LP24
LP23
12V 5W X 5
LP15
LP16
LP17
LP18
LP19
12V 5W X 3
LP20
LP21
LP22
D2 1S1885
SOL2
Mouth-
M6
J 83
J 84
J 26
J 27
J 28
J 30
J 31
J 82
J 25
J 18 PS26P
PS20P J 5
J 10 PS20P
PS34P J 2
2P J 9
J 35
J 34
J 88
J 89
J 1
6P J 7
J 91
J 98
J 24
J 11
J 12
J 13
J 14
J 15
J 18
J 19
J 20
J 21
J 22
J 23
LP1
LP2
LP3
LP4
LP5 2P- 18V 2W
LP6 1P- 18V 2W
SW2
SW3
SW4
SW5
SW7
SW8
VR1
DISP-LP1
DISP-LP2
J2-A8
J2-A15
TOKYO JAPAN
DRAWING
DESIGN
CHECKED
APPROVED
SCALE
TITLE
DRAW NO.
13109103
1/3)


PCB Assy
PCB Assy
PCB Assy
PS40P J 3
PS30P J 4
PS50P J 86
PS50P J 87
PS50P J 6
CR-SW→+5V
CR1-SW
CR-SW-GND
CR2-SW
CR3-SW
CR4-SW
CR5-SW
GATE-DOWN-LS
GATE-UP-LS
GATE +5V (NOT USED)
GATE GND
(NOT USED) GATE-MOTOR
(NOT USED) GATE-MOTOR-RET
(-1-) L.GN GN/WH, (-2-) L.BL BL/WH,
(-3-) W/L.GN R/WH, (-4-) W/L.BL R/BK.
Assy
TOKYO JAPAN
(2/3)
DRAW NO.
13109103

13109103

NO.	NAME OF PART	QUANT	MATERIAL	FINISH	NOTE



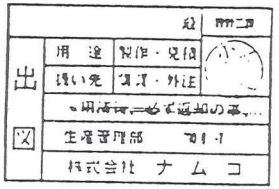
DRAWING	DESIGN	CHECKED	APPROVED	SCALE	TITLE
90.8.3			90.8.3		(3/3)

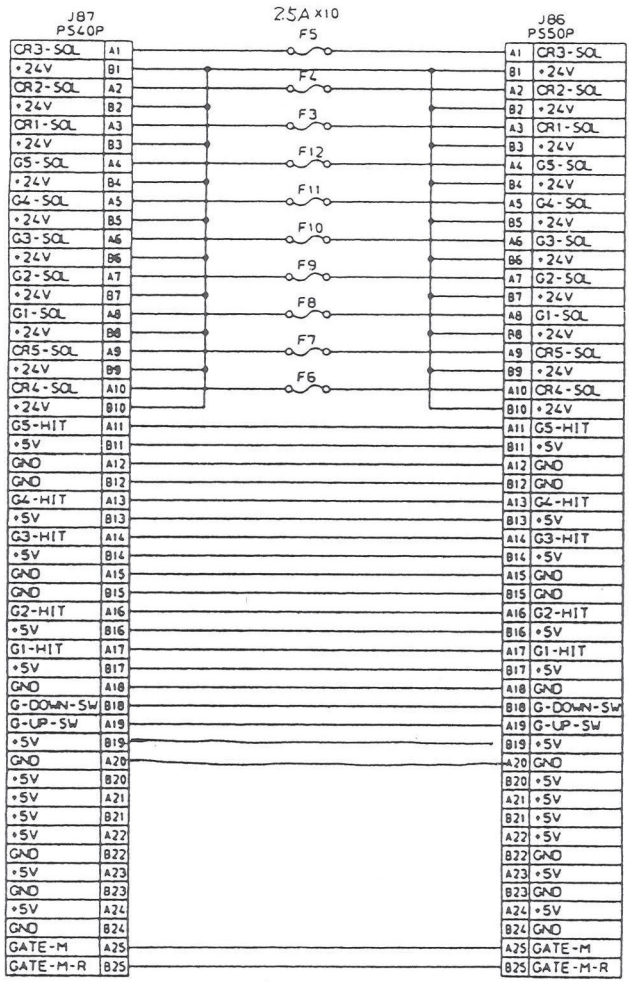
TOKYO JAPAN

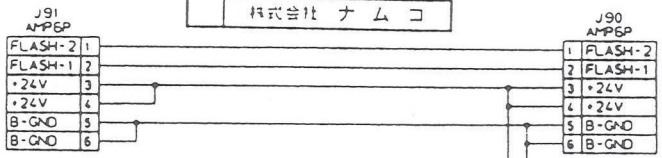
DRAW NO. 13109103

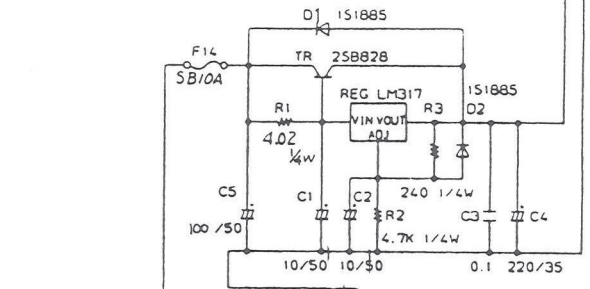
13109541

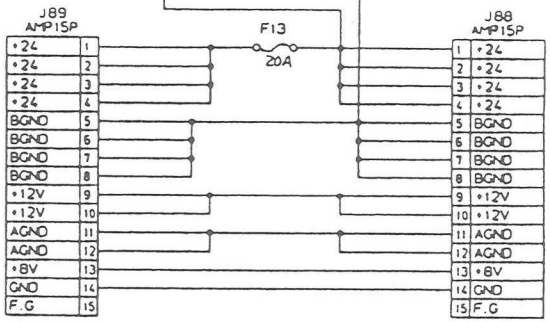
NO	NAME OF PART	QUANT	MATERIAL	FINISH	NOTE











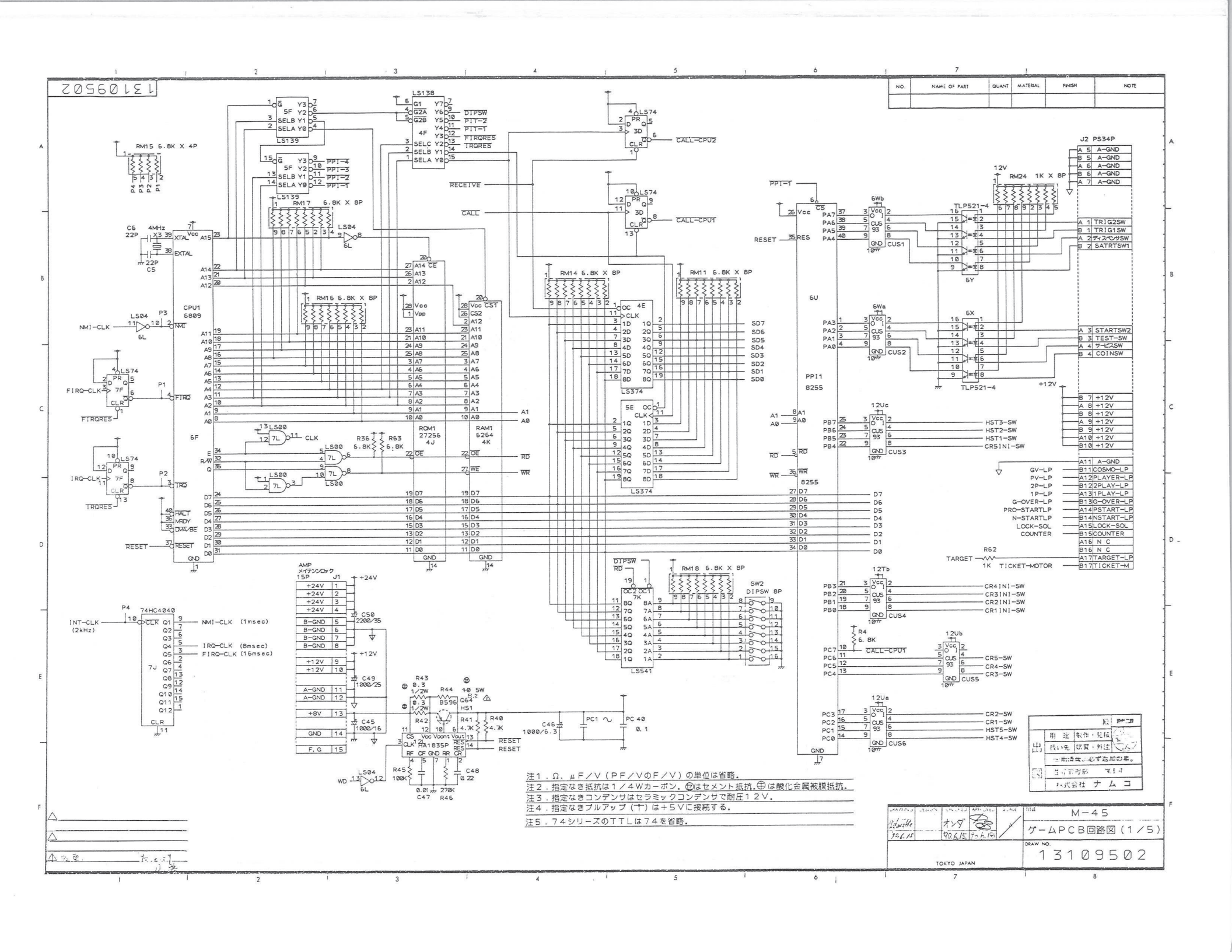
注1 抵抗の単位Ω、コンデンサの単位μF.四Dは省略している。
2 C3はセラミックコンデンサで耐圧50WVで他はアルミ電解コンデンサ。

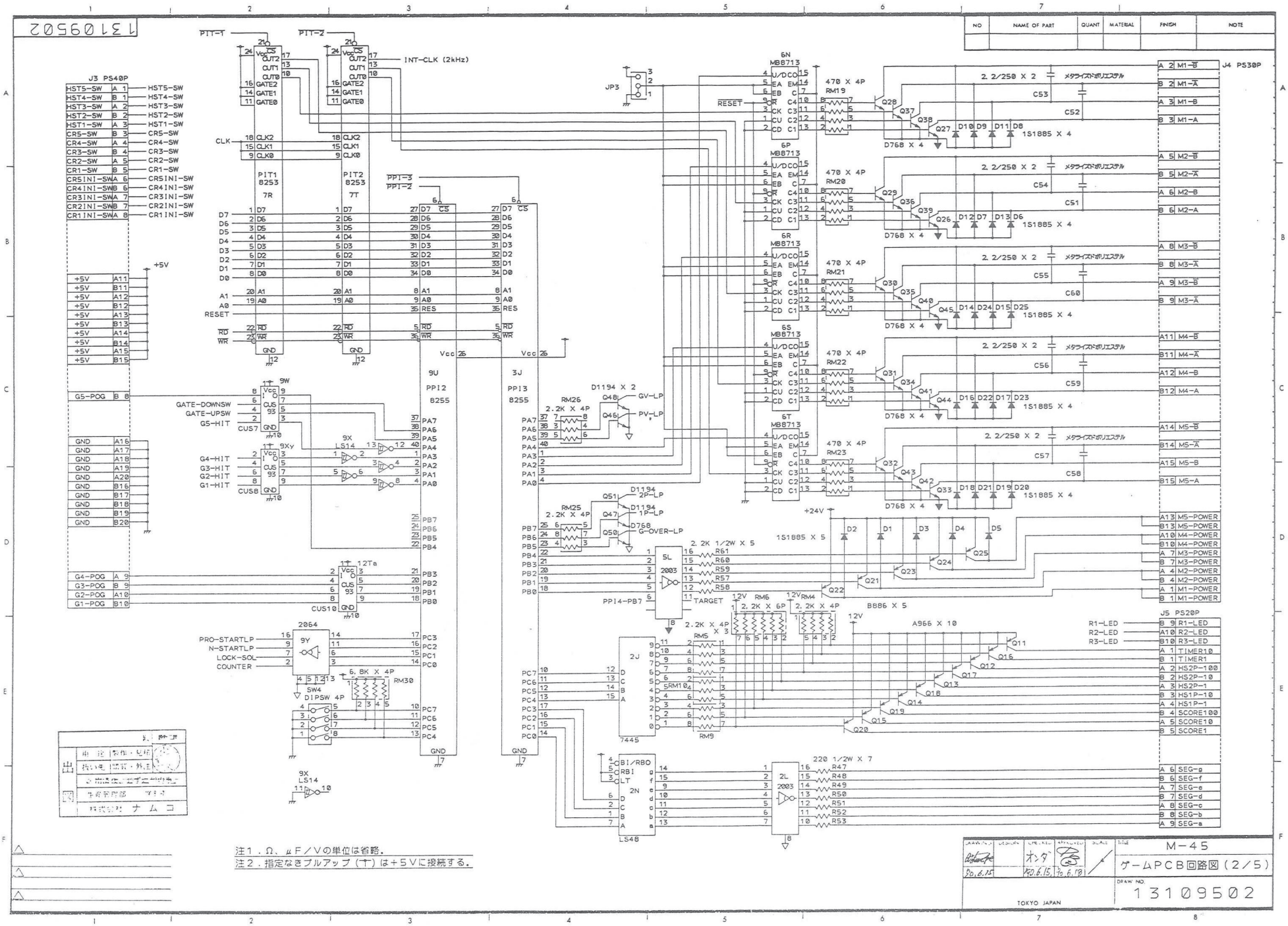
△
△
△ 90.7.18 回路変更 工大B
13109531 → 13109541

DRAWING	DESIGN	CHECKED	APPROVED	SCALE	TITLE
滝沢 90.7.3		堀 90.7.3	90.7.16		M-45 FUSE PCB 回路図 (1/1)

TOKYO JAPAN

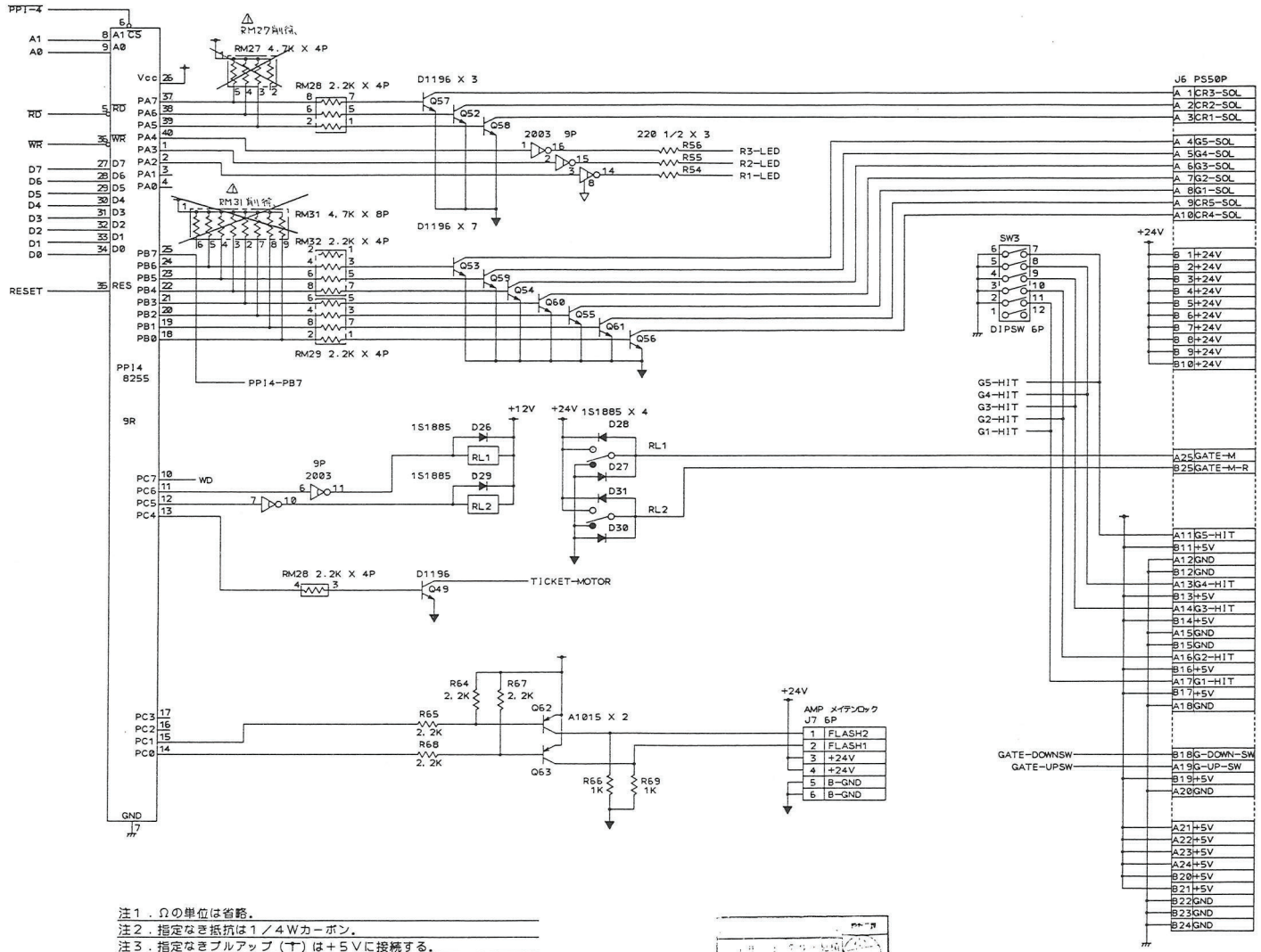
DRAW NO. 13109541


13109502
CPU1 6809
ROM1 27256 4J
RAM1 6264 4K
PPI1 8255
8255
J2 PS34P
A-GND
+12V
TRIG2SW
TRIG1SW
ディスペンサSW
SATRTSW1
STARTSW2
TEST-SW
サービスSW
COINSW
GV-LP
PV-LP
2P-LP
1P-LP
G-OVER-LP
PRO-STARTLP
N-STARTLP
LOCK-SOL
COUNTER
TARGET
TICKET-MOTOR
HST3-SW
HST2-SW
HST1-SW
CRS1IN1-SW
CR4IN1-SW
CR3IN1-SW
CR2IN1-SW
CR1IN1-SW
CR5-SW
CR4-SW
CR3-SW
CR2-SW
CR1-SW
HST5-SW
HST4-SW
CALL-CPU2
CALL-CPU1
RECEIVE
CALL
DIPSW
PIT-2
PIT-1
FIRQRES
TRQRES
NMI-CLK (1msec)
IRQ-CLK (8msec)
FIRQ-CLK (16msec)
注1．Ω、μF／V（PF／VのF／V）の単位は省略。
注2．指定なき抵抗は1／4Wカーボン．Ⓒはセメント抵抗．Ⓜは酸化金属被膜抵抗．
注3．指定なきコンデンサはセラミックコンデンサで耐圧12V．
注4．指定なきプルアップ（†）は+5Vに接続する。
注5．74シリーズのTTLは74を省略。
M-45
ゲームPCB回路図（1／5）
13109502
TOKYO JAPAN
株式会社 ナムコ


13109502
PIT-1
PIT-2
INT-CLK (2kHz)
J3 PS40P
HST5-SW
HST4-SW
HST3-SW
HST2-SW
HST1-SW
CR5-SW
CR4-SW
CR3-SW
CR2-SW
CR1-SW
CR5INI-SW
CR4INI-SW
CR3INI-SW
CR2INI-SW
CR1INI-SW
+5V
G5-POG
G4-POG
G3-POG
G2-POG
G1-POG
GND
CLK
RESET
RD
WR
PIT1 8253 7R
PIT2 8253 7T
PPI-3
PPI-2
9U PPI2 8255
3J PPI3 8255
GATE-DOWNSW
GATE-UPSW
G5-HIT
G4-HIT
G3-HIT
G2-HIT
G1-HIT
CUS7
CUS8
CUS10
9W
9X
9Xy
12Ta
LS14
2064
9Y
PRO-STARTLP
N-STARTLP
LOCK-SOL
COUNTER
SW4 DIPSW 4P
6.8K X 4P
RM30
JP3
RESET
6N MB8713
6P MB8713
6R MB8713
6S MB8713
6T MB8713
470 X 4P
RM19
RM20
RM21
RM22
RM23
2.2/250 X 2
メタライズドポリエステル
C53
C52
C54
C51
C55
C60
C56
C59
C57
C58
D768 X 4
1S1885 X 4
Q28
Q37
Q38
Q27
Q29
Q36
Q39
Q26
Q30
Q35
Q40
Q45
Q31
Q34
Q41
Q44
Q32
Q43
Q42
Q33
D10 D9 D11 D8
D12 D7 D13 D6
D14 D24 D15 D25
D16 D22 D17 D23
D18 D21 D19 D20
D1194 X 2
GV-LP
PV-LP
RM26
2.2K X 4P
Q48
Q46
Q51
Q47
Q50
D1194 2P-LP
D1194 1P-LP
D768 G-OVER-LP
RM25
+24V
1S1885 X 5
D2
D1
D3
D4
D5
Q25
Q24
Q23
Q21
Q22
5L 2003
2.2K 1/2W X 5
R61
R60
R59
R57
R58
TARGET
PP14-PB7
12V
RM6
2.2K X 6P
RM4
2.2K X 4P
B886 X 5
2.2K X 4P X 3
RM5
RM10
RM9
2J
7445
A966 X 10
Q11
Q16
Q12
Q17
Q13
Q18
Q14
Q19
Q15
Q20
R1-LED
R2-LED
R3-LED
2N LS48
2L 2003
220 1/2W X 7
R47
R48
R49
R50
R51
R52
R53
J4 PS30P
J5 PS20P
M1-B
M1-A
M2-B
M2-A
M3-B
M3-A
M4-B
M4-A
M5-B
M5-A
M1-POWER
M2-POWER
M3-POWER
M4-POWER
M5-POWER
TIMER10
TIMER1
HS2P-100
HS2P-10
HS2P-1
HS1P-10
HS1P-1
SCORE100
SCORE10
SCORE1
SEG-g
SEG-f
SEG-e
SEG-d
SEG-c
SEG-b
SEG-a
NO
NAME OF PART
QUANT
MATERIAL
FINISH
NOTE
注1．Ω、μF／Vの単位は省略。
注2．指定なきプルアップ（十）は＋5Vに接続する。
DRAWN
DESIGN
CHECKED
APPROVED
SCALE
'90.6.15
'90.6.15
'90.6.19
TITLE
M-45
ゲームPCB回路図（2/5）
DRAW NO.
13109502
TOKYO JAPAN

13109502

NO.	NAME OF PART	QUANT	MATERIAL	FINISH	NOTE



注1．Ωの単位は省略。
注2．指定なき抵抗は1／4Wカーボン。
注3．指定なきプルアップ（↑）は＋5Vに接続する。

△
△
△ 訂正 '90.6.07 ハヤシ

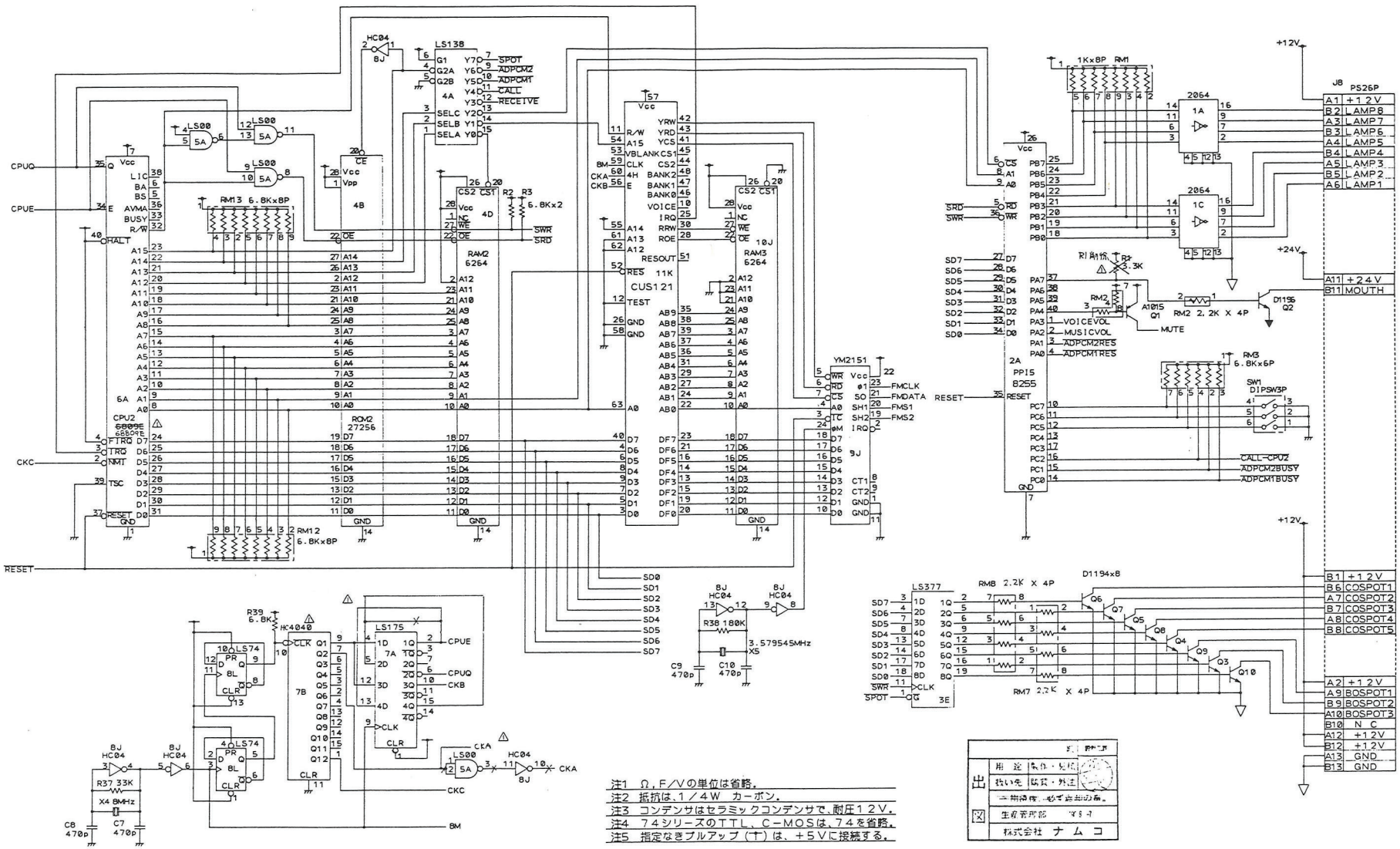
DRAWING	DESIGN	CHECKED	APPROVED	SCALE	TITLE
'90.6.15		オノ '90.6.15	'90.6.18		M-45 ゲームPCB回路図（3/5）

TOKYO JAPAN

DRAW NO 13109502

13109502

NO.	NAME OF PART	QUANT	MATERIAL	FINISH	NOTE



注1 Ω，F／Vの単位は省略。
注2 抵抗は、1／4W カーボン。
注3 コンデンサはセラミックコンデンサで、耐圧12V。
注4 74シリーズのTTL、C-MOSは、74を省略。
注5 指定なきプルアップ（十）は、+5Vに接続する。

出	用途	数量・ピン
	投いち	抵抗・外注
	一般部品	必ず出荷前
	生産管理部	
	株式会社 ナムコ	

DRAWN	CHECKED	APPROVED	SCALE
小澤 90.6.15	Watanabe 90.6.15	オンダ 90.6.15	

TOKYO JAPAN

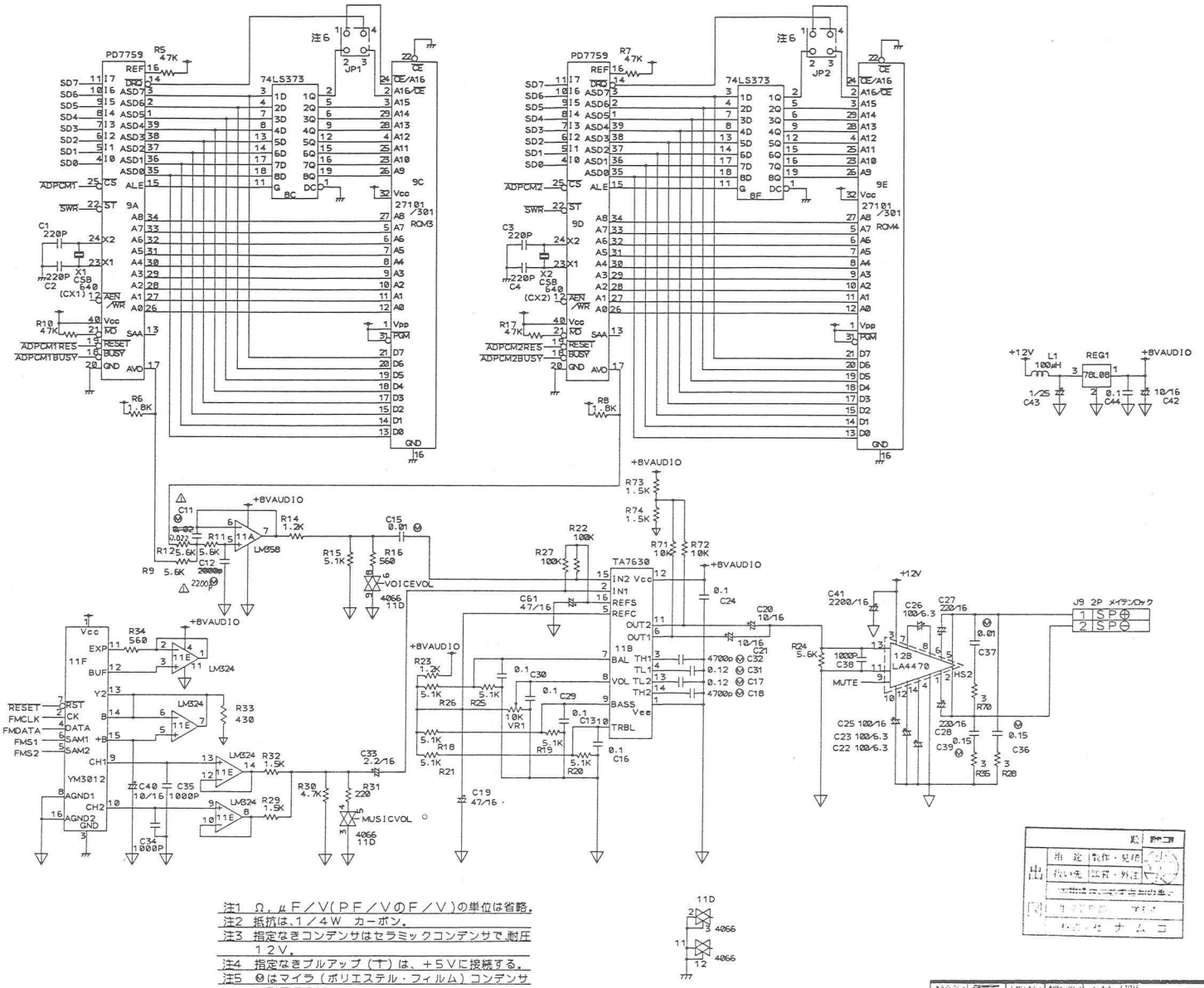
TITLE: M-45 ゲームPCB回路図（4／5）

DRAW NO: 13109502

△ 部品、変更 90.6.29 小澤

13109502

NO	NAME OF PART	QUANT	MATERIAL	FINISH	NOTE



注1 Ω，μF／V(PF／VのF／V)の単位は省略。
注2 抵抗は、1／4W カーボン。
注3 指定なきコンデンサはセラミックコンデンサで耐圧12V。
注4 指定なきプルアップ（↑）は、+5Vに接続する。
注5 Ⓜはマイラ（ポリエステル・フィルム）コンデンサで耐圧50V。
△注6 JP2,JP'sは、27101使用の時に1-4,2-3を27301を使用の時に1-2,3-4を短絡コネクタで短絡する。

△ 変更 90.6.29 小.栄

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	TITLE
小栄		オノダ		1/1	M-45 ゲームPCB回路図（5/5）
90.6.15	90.6.15	90.6.15	90.6.18		DRAW NO. 13109502

TOKYO JAPAN

13109511

NO	NAME OF PART	QUANT	MATERIAL	FINISH	NOTE

PS20P

TIMER10	A 1
TIMER1	B 1
HS2P-100	A 2
HS2P-10	B 2
HS2P-1	A 3
HS1P-10	B 3
HS1P-1	A 4
SCORE100	B 4
SCORE10	A 5
SCORE1	B 5
SEG-g	A 6
SEG-f	B 6
SEG-g	A 7
SEG-d	B 7
SEG-c	A 8
SEG-b	B 8
SEG-a	A 9
R1-LED	B 9
R2-LED	A10
R3-LED	B10

LED36 LED37 LED38 LT9220D

LED1 LED2 LED3 LED4 LED5 LED6 LED7 MU04-2101 X 7

LED8 LED9 LED10 LED11 LED12 LED13 LED14 MU04-2101 X 7

LED15 LED16 MU04-2101 X 2

LED17 LED18 LED19 LED20 LED21 LED22 LED23 MU04-2101 X 7

LED24 LED25 LED26 LED27 LED28 LED29 LED30 MU04-2101 X 7

LED31 LED32 LED33 GL-9D10 X 3

LED34 LED35 GL-9D10 X 2

DRAWING	DESIGNED	CHECKED	APPROVED	DATE
Utsumi				
90.2.10			90.2.15	

TOKYO JAPAN

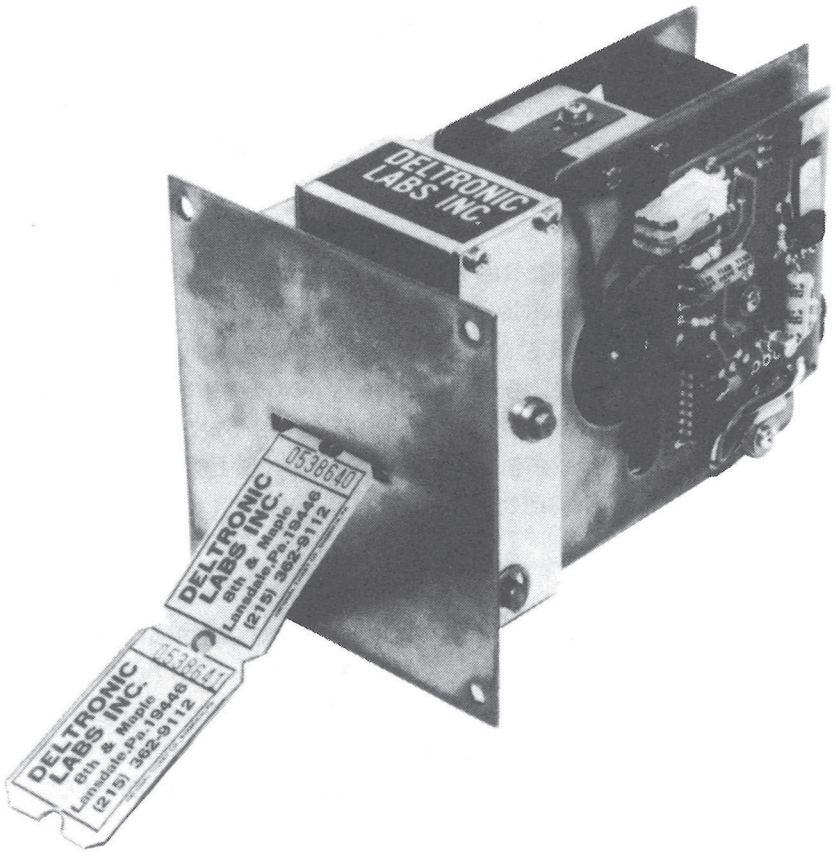
TITLE M-45 スコアPCB回路図

DRAW NO 13109511

TICKET DISPENSER

Each **COSMOGANG** game leaves the factory with 2 ticket dispensers. Deltronics Labs Inc. model DL-1275 and DL-4-S-S. Refer to the ticket dispenser manuals packed with each game for maintenance and trouble shooting advice. Tickets are dispensed as the game is played. Refer to the Operator Selectable Options table for settings.

Ticket Dispenser MANUAL



Ticket Dispenser

Another quality product from Deltronic Labs Inc.
. . . the industry leader in ticket dispensers

Deltronic Labs inc.

120 Liberty Lane, Chalfont, PA 18914
215-997-8616 • FAX # 215-997-9506

DELTRONIC LABS INC.

Ticket Dispenser

PATENT NO. 4272001

1. Manual Loading Of Tickets

Tickets are inserted into the rear of ticket chute and pushed forward. The power driven roller will be spring loaded against the idler roller and tickets will not pass until rollers are clear of each other. This is accomplished by use of thumb and index finger, one placed on the block to which spring is attached, the other on the pivot bracket assembly, then squeeze. Push tickets through until you see edge of ticket. Machine is now ready to operate.

2. Electronic System

Attached to the ticket machine is a solid state motor controller, which provides dynamic braking to ensure accurate and repeatable ticket stopping after issuing any number of tickets. Included as part of the controller is ticket sensing by means of an opto-electronic beam breaker sensor, which detects the notch between tickets. The output of the ticket sensing circuitry is an open collector transistor.

3. Roller Tension Spring

The roller tension spring keeps constant tension on tickets, which insures proper delivery and prevents tickets from being pulled through when the dispenser is idle. To increase tension, loosen screw and move spring forward. Tension is adjusted correctly when tickets cannot be pulled from dispenser.

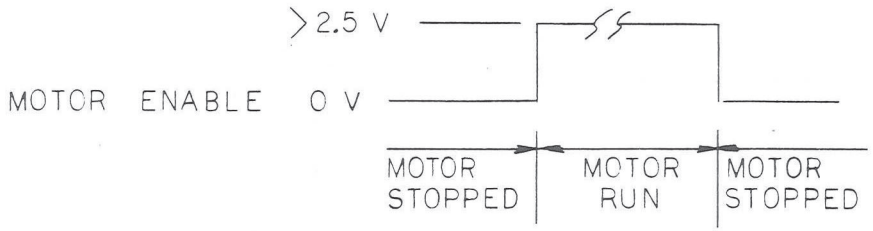
4. Ticket Guide Spring

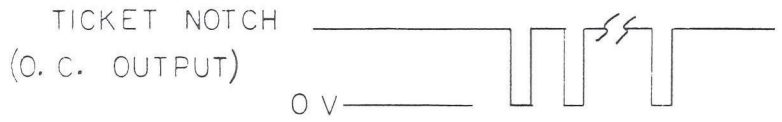
The ticket guide spring insures that the notches in the tickets pass through the opto-beam breaker sensor. To decrease tension, loosen screw and move outer spring up. This changes the tension on the inner spring. Tickets should be snug between spring and side plate but not deformed by excess tension. The spring is adjusted at the factory for 1 5/32" wide tickets.

5. Ticket Stop Adjustment

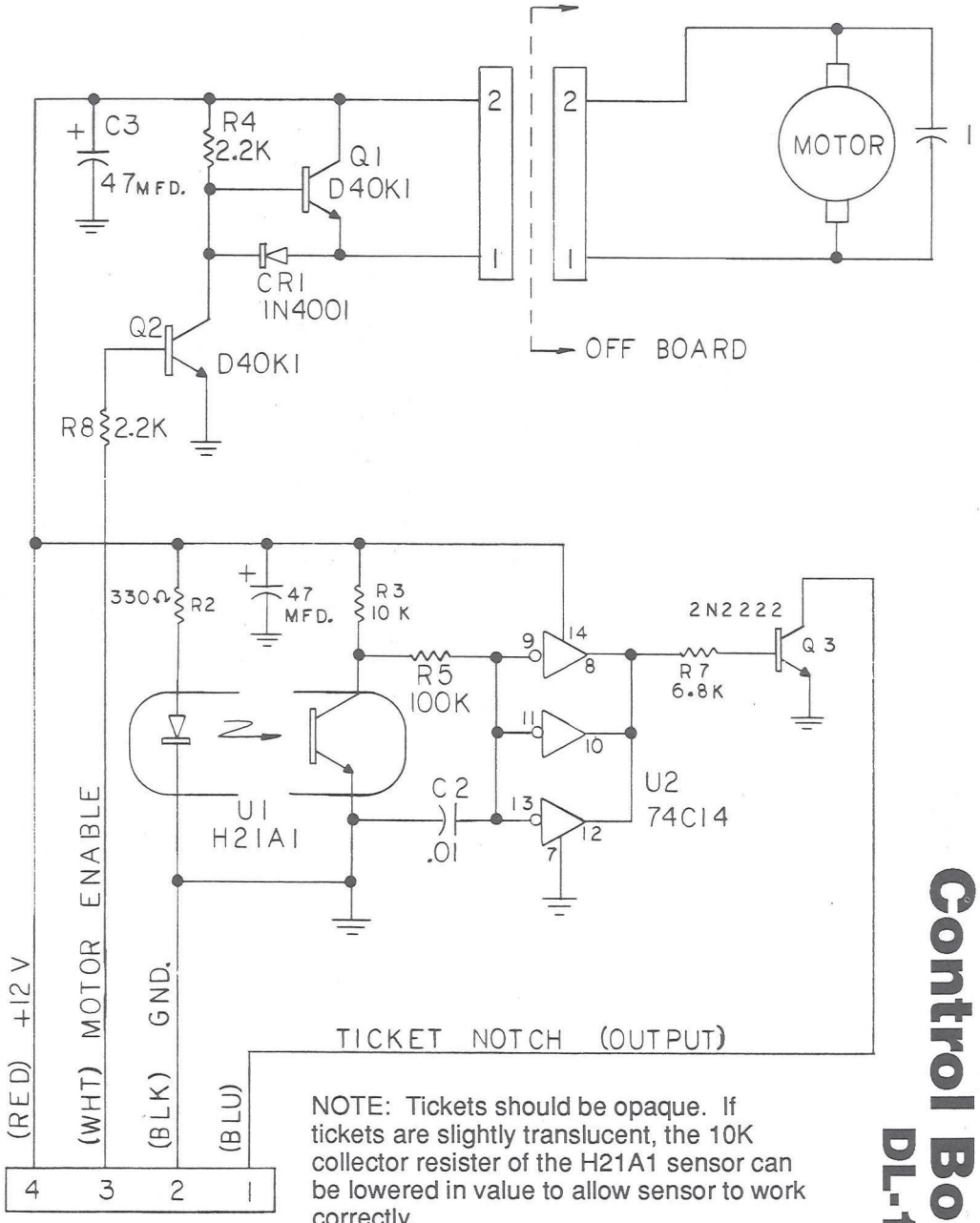
The ticket stop adjustment allows positioning of tickets while the machine is off. The ticket should protrude through the slot approximately 1/16". The ticket dispenser P.C. board is mounted with 2 screws in 2 slotted holes. Loosening the screws and moving the board forward, will allow the tickets to stop farther out beyond the edge of the slot.

	MIN.	TYP.	MAX.
MOTOR SUPPLY — V	11 V	12 V	13 V
I (START) —	1.3 A	1.5 A	1.7 A
(RUN) —	—	.4 A	.85 A
(STANDBY)	—	—	30 MA
MOTOR ENABLE ON — V —	+2.5 V	—	+12 V
I —	250μA	—	2.5 MA
MOTOR ENABLE OFF — V —	—	—	1.0 V
I —	—	—	0
TICKET NOTCH — SINK — I —	—	—	50 MA
V PULL-UP	—	—	30 V





INTERFACE SPECIFICATIONS



Connector
Molex # 03-09-2041

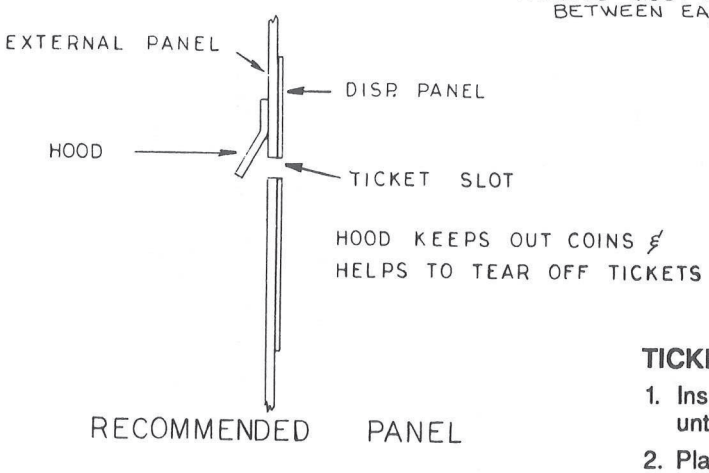
NOTE: Tickets should be opaque. If tickets are slightly translucent, the 10K collector resister of the H21A1 sensor can be lowered in value to allow sensor to work correctly.

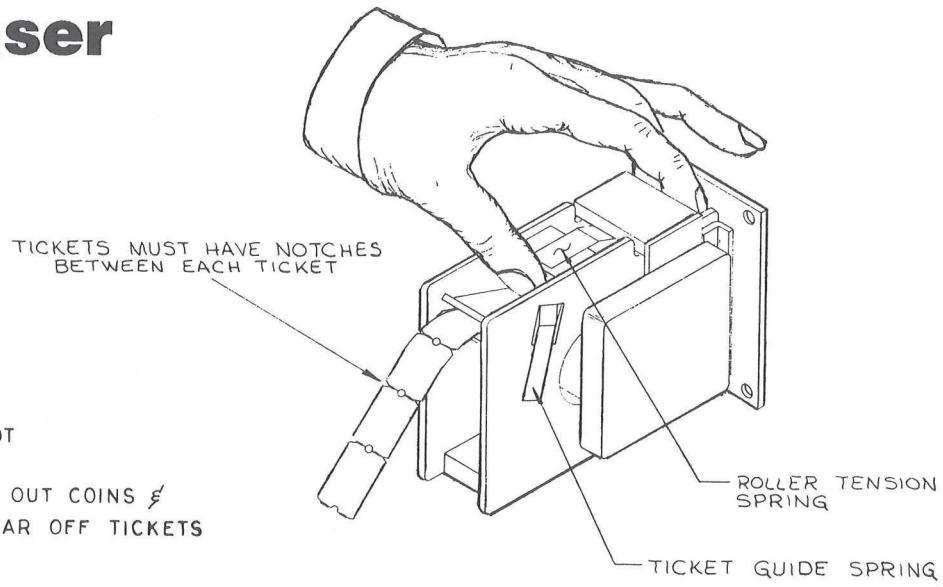
DEL TRONIC LABS INC.

Control Board DL-1275

DELTRONIC LABS INC.

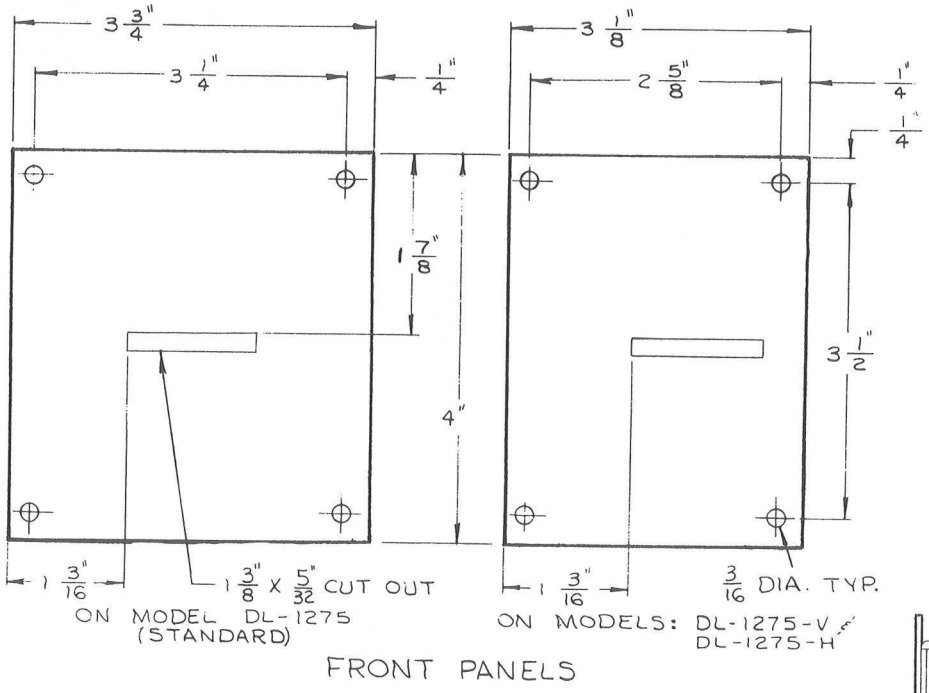
Ticket Dispenser



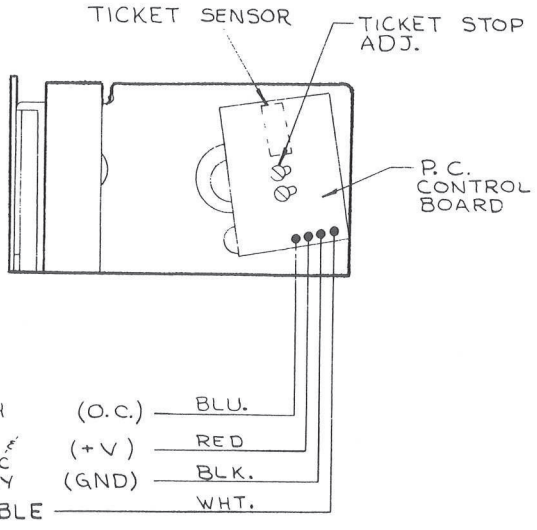


TICKET LOADING DIRECTIONS:

1. Insert tickets as indicated and feed tickets past the ticket guide spring until they stop.
2. Place fingers as indicated and squeeze, this opened the feed rollers.
3. Feed tickets until the first ticket protrudes approx. 1/16" beyond the dispatch slot.
4. Release rollers, Ticket Dispenser is now loaded and ready for use.



FRONT PANELS

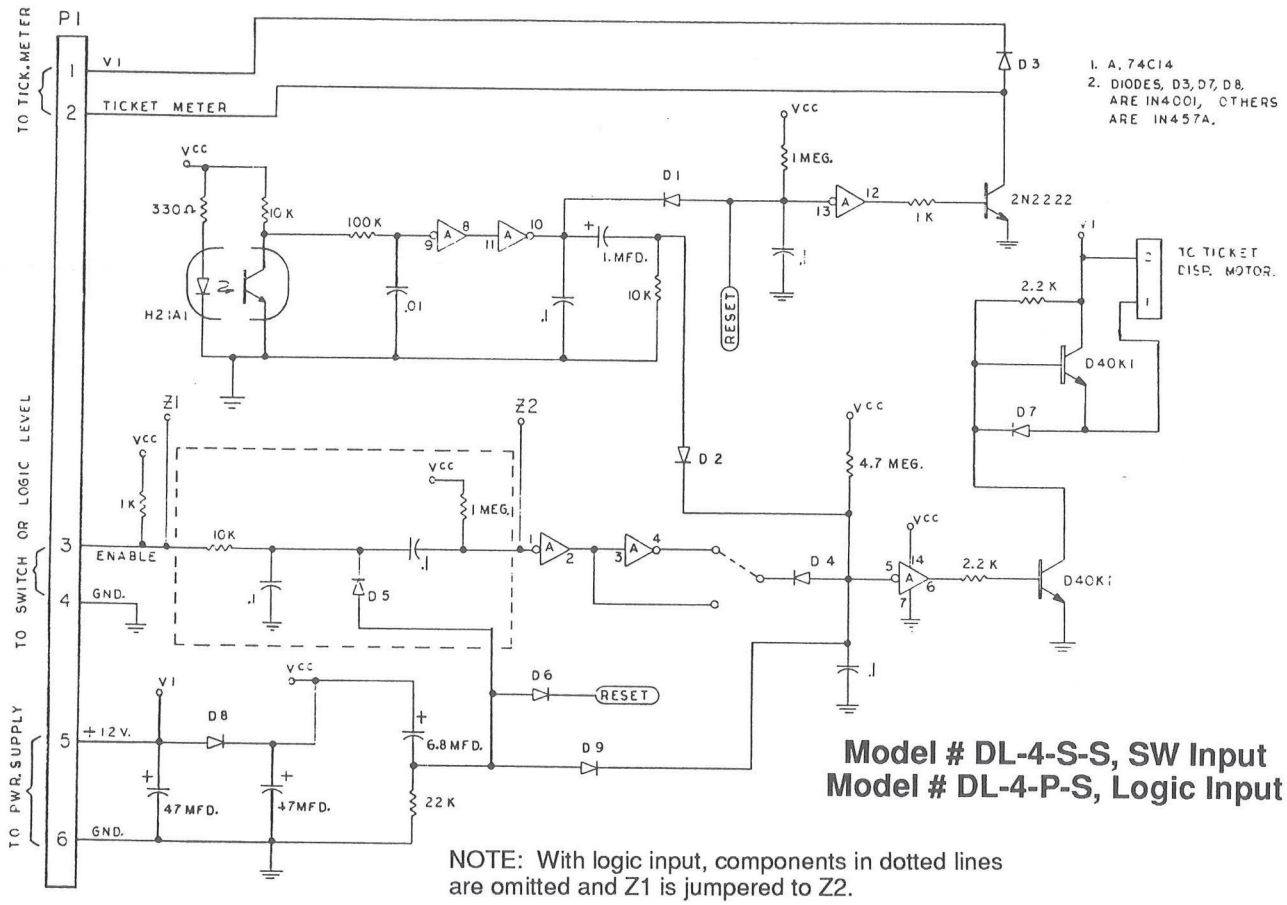


TICKET DISPENSER DIMENSIONS

LENGTH:	5-1/2"
HEIGTH:	4"
WIDTH:	3-1/8"

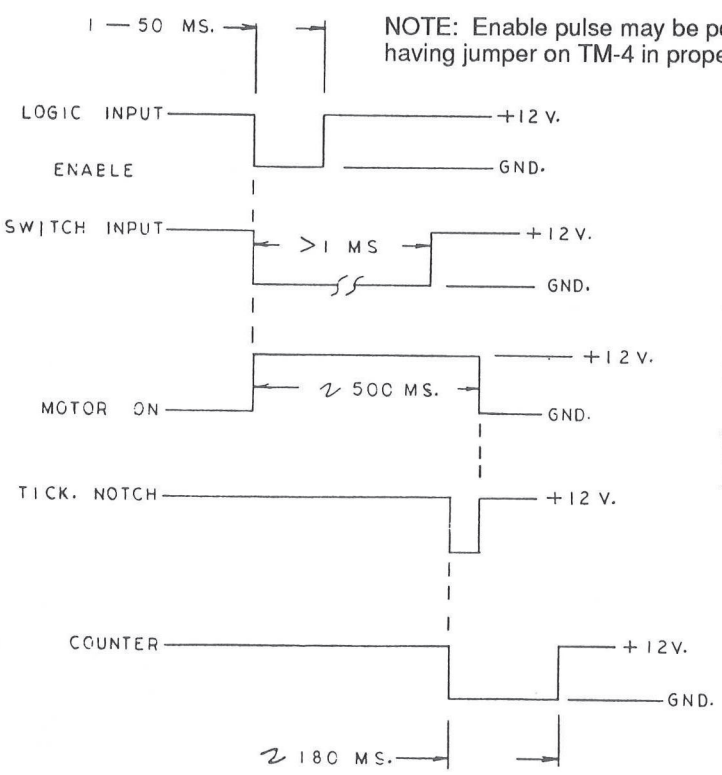
DELTRONIC LABS INC.

Control Board
DL-4-S-S DL-4-P-S

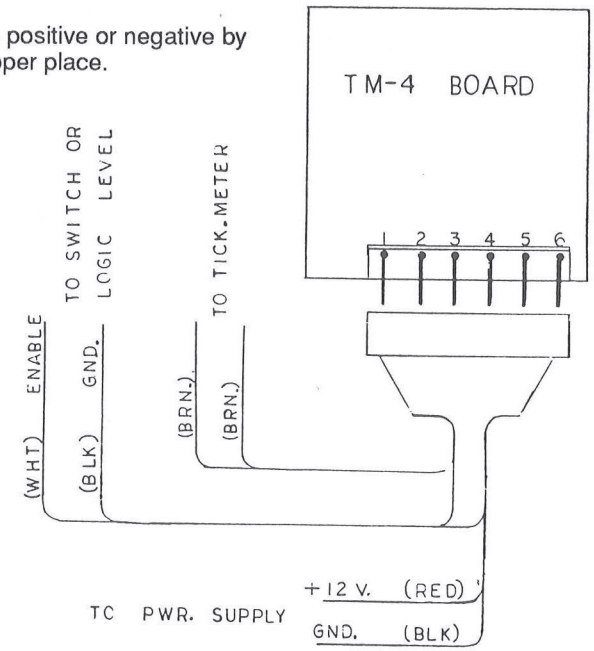


Model # DL-4-S-S, SW Input
Model # DL-4-P-S, Logic Input

NOTE: With logic input, components in dotted lines are omitted and Z1 is jumpered to Z2.



NOTE: Enable pulse may be positive or negative by having jumper on TM-4 in proper place.



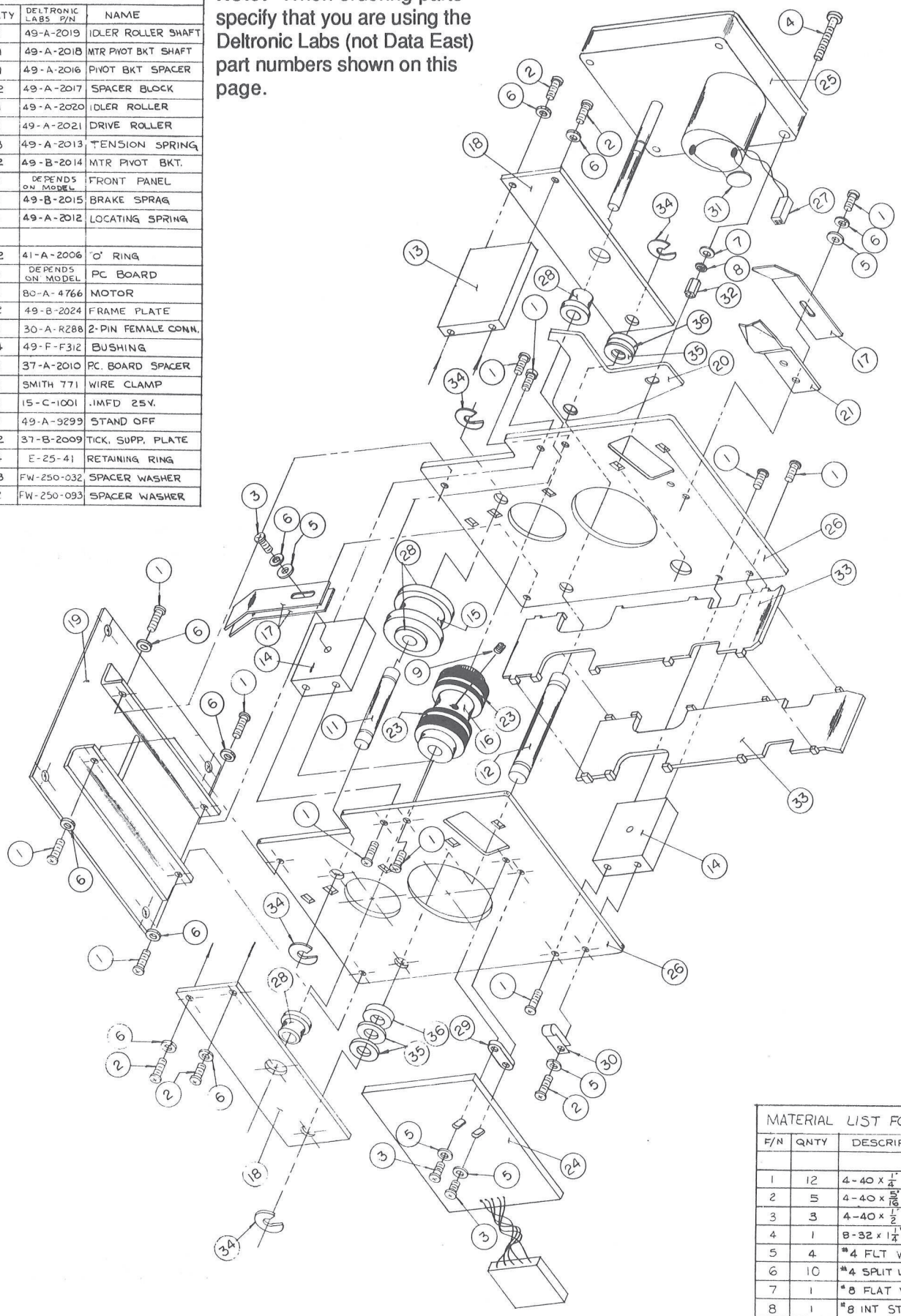
Model # DL-4-S-S
Model # DL-4-P-S

DELTRONIC LABS INC.

Ticket Dispenser Assembly

DETAILS OF PARTS			
F/N	QNTY	DELTRONIC LABS P/N	NAME
11	1	49-A-2019	IDLER ROLLER SHAFT
12	1	49-A-2018	MTR PIVOT BKT SHAFT
13	1	49-A-2016	PIVOT BKT SPACER
14	2	49-A-2017	SPACER BLOCK
15	1	49-A-2020	IDLER ROLLER
16	1	49-A-2021	DRIVE ROLLER
17	3	49-A-2013	TENSION SPRING
18	2	49-B-2014	MTR PIVOT BKT.
19	1	DEPENDS ON MODEL	FRONT PANEL
20	1	49-B-2015	BRAKE SPRAG
21	1	49-A-2012	LOCATING SPRING
22			
23	2	41-A-2006	'O' RING
24	1	DEPENDS ON MODEL	PC BOARD
25	1	80-A-4766	MOTOR
26	2	49-B-2024	FRAME PLATE
27	1	30-A-R288	2-PIN FEMALE CONN.
28	4	49-F-F312	BUSHING
29	1	37-A-2010	PC. BOARD SPACER
30	1	SMITH 771	WIRE CLAMP
31	1	15-C-1001	.1MFD 25V.
32	1	49-A-9299	STAND OFF
33	2	37-B-2009	TICK. SUPP. PLATE
34	4	E-25-41	RETAINING RING
35	3	FW-250-032	SPACER WASHER
36	2	FW-250-093	SPACER WASHER

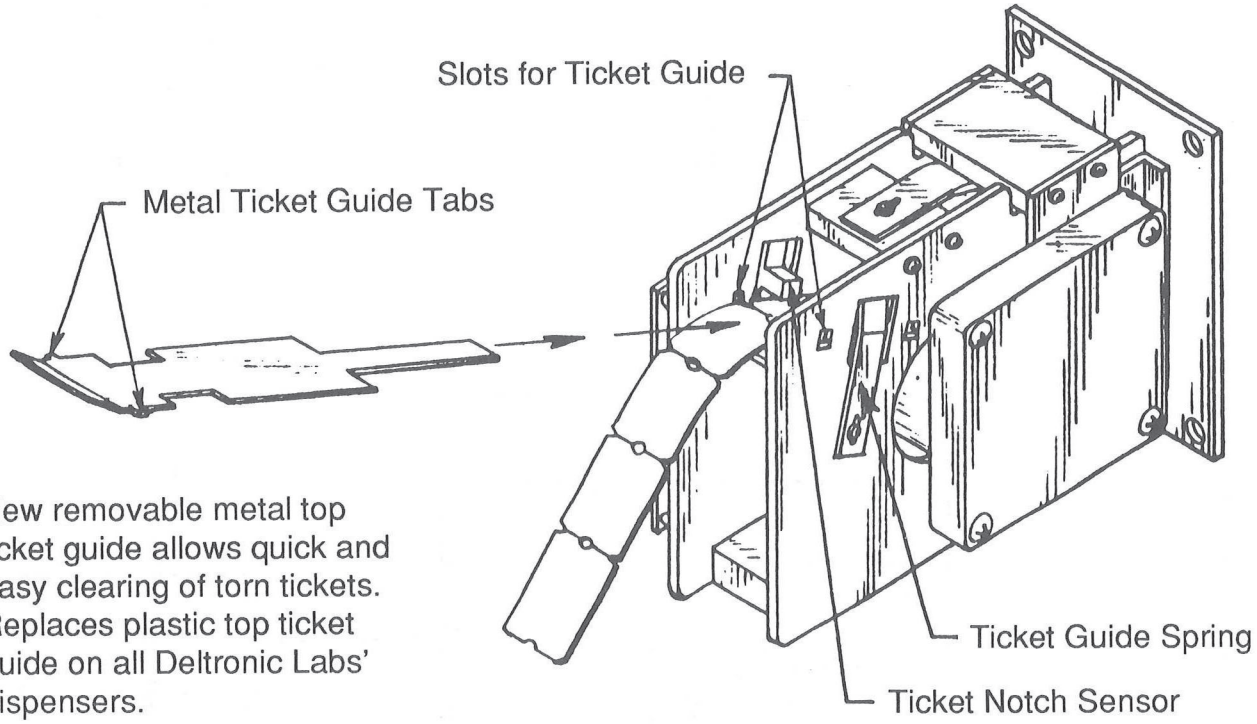
Note: When ordering parts specify that you are using the Deltronic Labs (not Data East) part numbers shown on this page.



MATERIAL LIST FOR SCREWS		
F/N	QNTY	DESCRIPTION
1	12	4-40 x 1/4"
2	5	4-40 x 5/16"
3	3	4-40 x 1/2"
4	1	8-32 x 1 1/4"
5	4	#4 FLT WASHER
6	10	#4 SPLIT LOC. WASHER
7	1	#8 FLAT WASHER
8	1	#8 INT STAR WASHER
9	1	8-32 x 3/16" SET SCREW

DELTRONIC LABS INC.

Quick Release Metal Ticket Guide



New removable metal top ticket guide allows quick and easy clearing of torn tickets. Replaces plastic top ticket guide on all Deltronic Labs' dispensers.

Instructions: STEP 1. Remove Top Plastic Ticket Guide
STEP 2. Insert Metal Guide parallel to bottom plastic Guide, above sensor and ticket guide spring until Guide tabs touch rear of frame sides. Slightly twist Guide clockwise until right tab slides within frame sides. Continue sliding guide parallel. When cut-outs on Ticket Guide align with sensor tabs engage with mounting slots in frame sides. Make sure that the front of the Guide extends thru the slot in front panel of dispenser.

To Remove Metal Guide: Spread frame sides slightly and twist Guide clockwise. Remove guide by reversing Step 2.

Ticket Dispenser Validation Kit

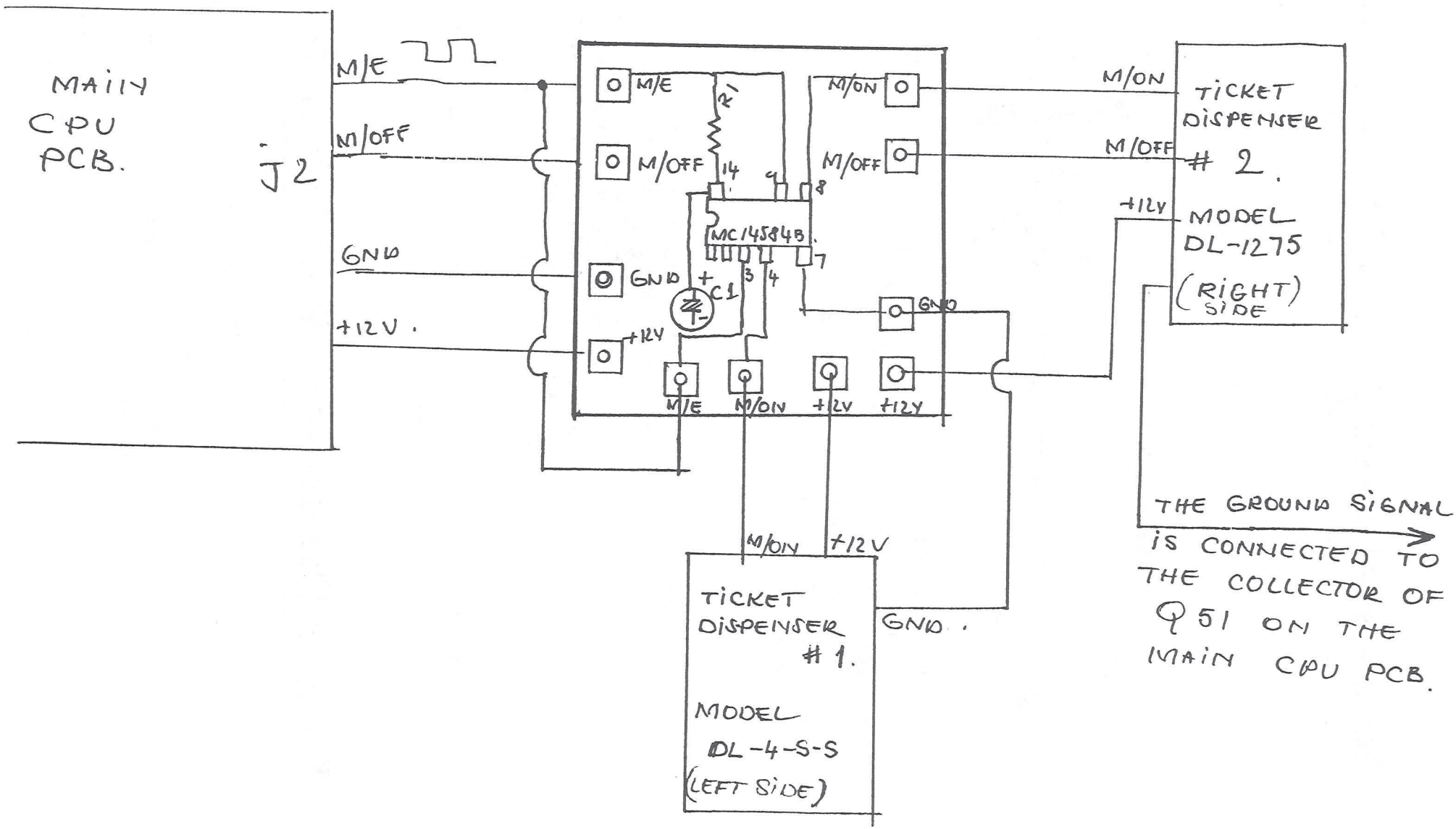
Function: As tickets pass through the dispenser, they are indented by coarse "diamond" knurls. The metal ticket guide can be snapped out and in again for servicing idler and drive rollers.

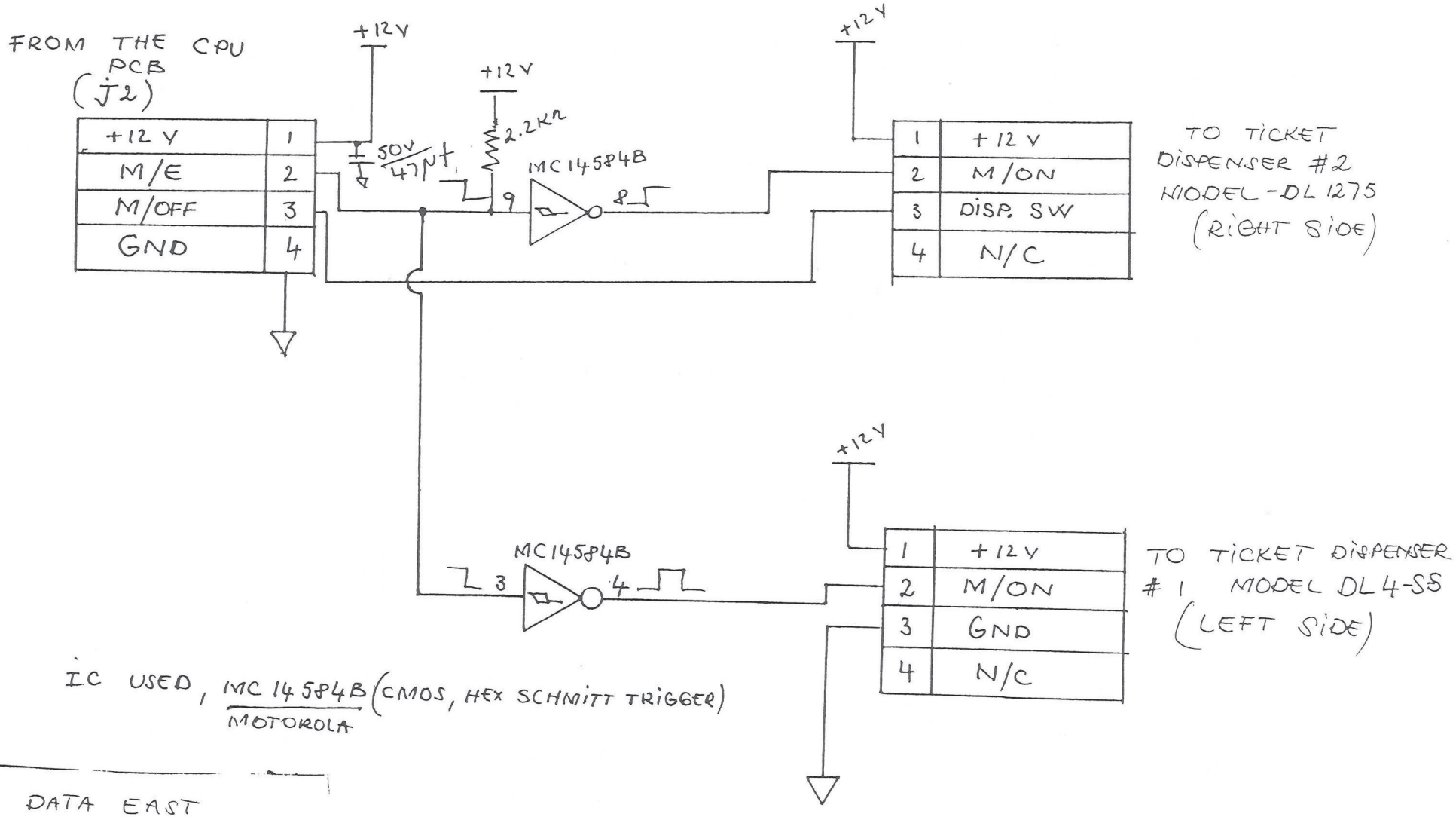
Retrofits existing rollers and top plastic ticket guide in all Deltronic dispensers.

Contents:
1 knurled metal drive roller - replaces present drive roller
2 knurled metal idler rollers - replaces present idler roller
1 metal ticket guide - replaces top plastic guide, bottom plastic guide remains

TICKET DISPENSER
INTERFACE PCB, SIZE : 2" x 2"

Layout for version "A" PCB

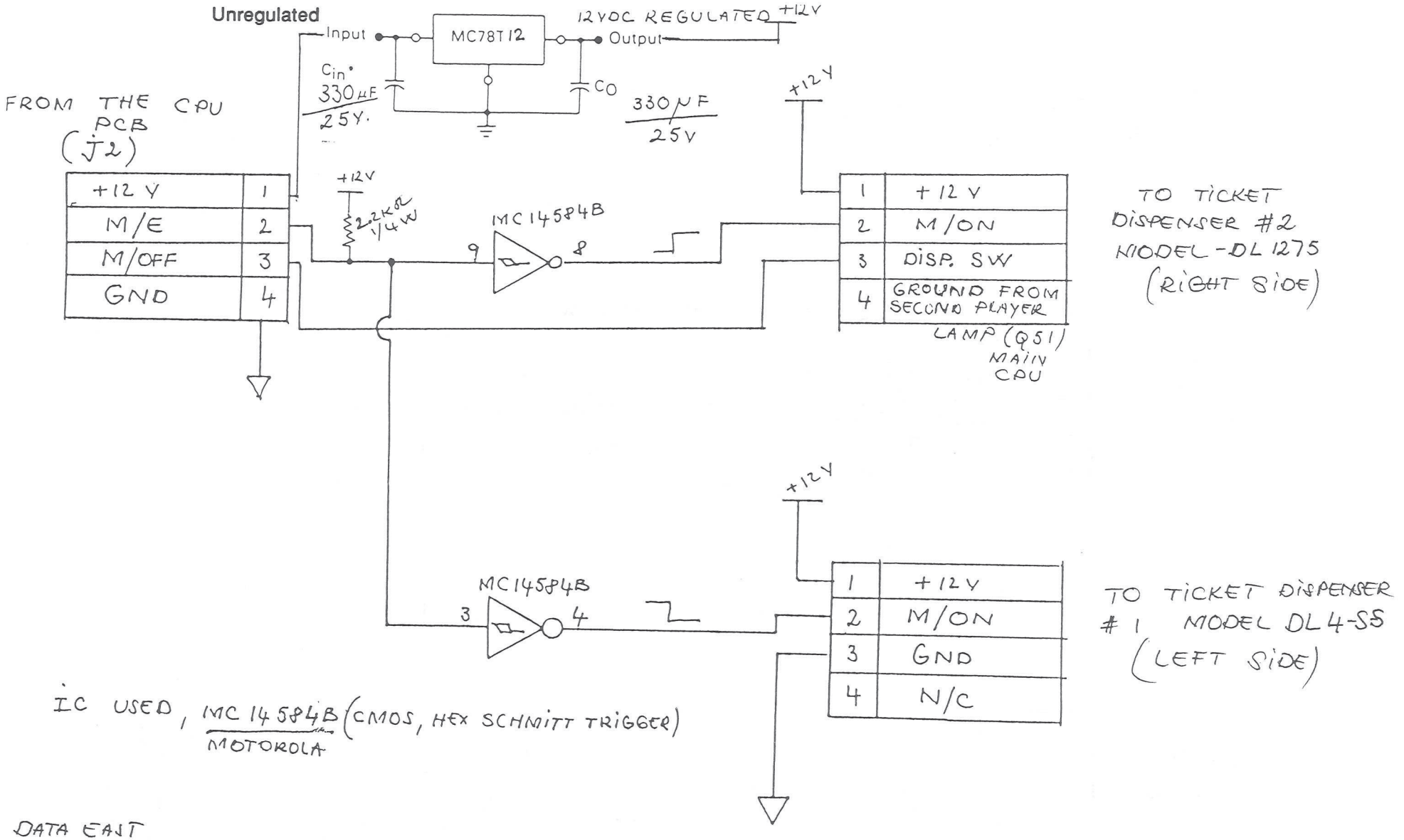




IC USED, IMC 14584B (CMOS, HEX SCHMITT TRIGGER)
MOTOROLA

DATA EAST
PART #: 520-0106-00
VERSION A.

"COSMO GANG"
TICKET DISPENSER INTERFACE PCB



IC USED, MC 14584B (CMOS, HEX SCHMITT TRIGGER)
MOTOROLA

DATA EAST

PART #: 520-0106-01
VERSION B.

"COSMO GANG"
TICKET DISPENSER INTERFACE PCB

REPLACEABLE PARTS

This section provides you with the necessary information for ordering replacement parts for your **COSMOGANG** game. When ordering parts, please provide both the complete description and part number. This will help to avoid confusion and mistakes in your order. We hope the results will be less down time and more profit from your games.

There are several identical connectors located on the printed circuit boards:
- Fuse PCB
- CPU PCB
- XENON Power Supply PCB

There are 9 connectors on the CPU board,from J1 to J9.

J1 to J89 from CPU to Fuse PCB

J7 to J89 from CPU to Fuse PCB

J6 to J87 from CPU to Fuse PCB

J2 and J9 from CPU to Gun, Service Panel and Control Panel

J90 from Fuse PCB to XENON tubes. There are 2 XENON power PCBs:
- Upper PCB - XENON Tube of Player 2, Right Gun
- Lower PCB - XENON Tube of Player 1, Left Gun

J88 from Power Supply Assembly

J86 from FUSE PCB to CHARACTERS and Energy Cubes

J5 to J10 from CPU to Display PCB

J4 from CPU to Motor Assemblies of Drive Units

J8 from CPU to Dome Lamps

J3 from CPU to Sensor PCBs on the rails

515-0076-00 CONTROL PANEL ASSY, COSMO
Part Number Description

LIST OF MATERIALS

ITEM	PART NUMBER	REV	QTY/ASY	QTY/GM	DESCRIPTION
01	036-0254-00		1		Harness, Control Panel
02	180-0031-00		1		Illuminated Pshbtn w/μsw,Small,R,Green
03	180-0032-00		1		Ill. Pshbtn w/μsw,Small,R,Orange
04	366-0032-00		1		Control Panel
05 *	510-0202-00		2	2	Gun Assy
06	660-0008-00		1	1	Plex, Clear 15" X 11 7/8"
07	234-0003-05		6		Screw, #8-32 - 1 1/4, Button, Hex, MS
08	242-5011-00		6		Washer, Flat #8
09	239-0002-00		6		Nut, Kep, #8-32
10	810-0048-00		1	1	Underlay, Instruction
11	535-0165-00		1	1	Control Panel Retainer
12	165-0008-00		2		Lamp, #1816, 13V, .33A
13	077-5009-00		2	2	Miniature Bayonet Socket
14	040-0003-00	A	15		Tywrap, 4"
15	232-0002-00		6		Screw, Pan, #8 X 1/2 SMS
16	242-0019-00		2	2	Washer (A), White, Plastic
17	535-0172-00		1	2	Gun Base (C), Top
18	535-0173-00		1	2	Gun Base (D), Bottom
19	231-0015-06		4		Bolt, Hex Head 5/16 - 18 X 1 1/2"
20	231-0004-04		4		Bolt, 5/16 - 18 X 1 1/2 FH, Phil
21	244-0012-00	A	16		Washer, Split Lock, 5/16
22	238-0015-00		8		Nut, Kep, 5/16 - 18
23	234-0011-03		6		Screw, Socket, Hex, #12-24 X 1",MS
24	530-0032-00		1	2	Gun Shaft (A)
25	254-0018-00		1	2	Spacer (B), ID=.4, OD=.63, t=.41
26	234-0012-01		2		1/4 - 20 X 1/2", Socket Hex Head, MS
27	244-0002-00		4		Washer, 1/4 Split Lock
28	242-0020-00		1	2	Washer, Flat, Fender, ID=1/4, OD=3/4"
29	285-0006-00		2	4	Bumper, Rubber, Black
30	237-0009-01		2		Screw, Pan Head, Phil,10-24 X 1",MS
31	242-0010-00		2		Washer, Flat, #10
32	239-0001-00		2		Nut, Kep, 10-24
33	233-0010-02		12		Screw, FH, #10 X 1/2 SMS
35 *	545-0028-00		1	2	Cover base, Blue
36 *	280-0015-00		1	2	Bushing, White

end

Released : 01-23-91
Revision A: 02-05-91

510-0209-00 FRONT BOX ASSY, COSMO
Part Number Description

LIST OF MATERIALS

ITEM	PART NUMBER	REV	QTY/ASY	QTY/GM	DESCRIPTION
01	036-0239-00		1	1	Harness, J5 - J10 (to display)
02	036-0240-00		1	1	Harness, J7- J91 (to fuse pcb)
03	036-0241-00		1	1	Harness, J6 - J87 (from cpu to fuse)
04	036-0242-00		1	1	Harness, J1 - J89 (from cpu to fuse)
05	036-0245-00		1	1	Harness, J2 - J9 (fr. cpu to ctrl pnl
06	036-0246-01		1	1	Harness, Xenon Tube, Player 1, 26"
07	036-0246-02		1	1	Harness, Xenon Tube, Player 2, 56"
08	036-0244-00		1	1	Harness, J90 (fr.fuse pcb - xenon pcb)
09	036-0258-00		1	1	Harness, J88 (from fuse pcb to P.S)
10	036-0262-00		1	1	Harness, Ticket Dispenser, Cpu Side
11	036-0263-01		1	1	Harness, Ticket Disp., Player 1, 4-S-S
12	036-0263-02		1	1	Harness, Ticket Disp., Player 2, DL1275
13	036-0270-00		1	1	Harness, Maintenance
14	036-0271-00		1	1	Harness, Lock out coil
15	040-0001-00		3		Clamp, Cable, Stickdown
16	040-0007-00		4		Clamp, Cable, Nylon, 3/8"
17	040-0006-00		8		Clamp, Cable, Nylon, 3/4"
18	040-0003-00	B	30		Tywrap, 4"
19	232-0003-00		10		Screw, PH, #6 X 1/2 SMS
20	232-0002-00		12		Screw, PH, #8 X 1/2 SMS
21	232-0002-01		18		Screw, PH, #8 X 5/8 SMS
22	366-0022-00		1	1	Front Box
23	366-0026-00		1	2	Ticket Door
24	231-0007-03		8		#10 - 24 X 1 1/4 Carriage Bolt
25	242-0010-00		8		Washer, Flat,#10
26	239-0001-00	C	17		Nut, Kep, 10 -24
27	535-0121-00		1	2	Trim Plate
28	535-0174-00		1	1	Xenon Pcb Grill
29	535-0131-00		4		Z Bracket
30	232-0007-00		4		Screw, #6-32 X 1/4, PH, MS
31	239-0009-00		4		Nut, Kep, #6-32
32	254-0008-00		8		Spacer, Aluminum, ID=3/16, OD=3/8
33	232-0003-01		8		Screw, Phil, #6 X 3/4, SMS
34	510-0168-00		1	1	Ticket Dispenser, DL-1275
35	510-0212-00		1	1	Ticket Dispenser, DL-4-S-S
36	535-0094-00		2	4	Ticket Cartridge
37a	510-0203-00		1	1	Coin Door Assembly w/ lockout coil
37b	510-0203-01	A	**STANDARD DOOR**		**W/OUT COIN MECH (ENGLAND)**
38	535-0178-00		1		Speaker Grill (For Ventilation)
38a	535-0178-01	B	1		Grill, Ventilation, Plastic
39 *	510-0200-00		1	2	Pcb, Xenon Power
40	520-0106-00		1	1	Pcb, Ticket Interface
41 *	510-0198-00		1	1	Cpu Board
42	510-0201-00		1	1	Fuse Pcb
43 **	200-0022-00		1		Fuse, 10A, 125V, Slo Blo
44 **	200-0023-00		1	1	Fuse, 20A, Fast Blo
45 **	200-0024-00		10		Fuse, 2.5A, 250V, Fast Blo
46	515-0076-00		1	1	Control Panel Assy
47	515-0078-00		1	2	Xenon Lamp Assy

510-0209-00 FRONT BOX ASSY, COSMO (Continued)
Part Number Description

ITEM	PART NUMBER	REV	QTY/ASY	QTY/GM	DESCRIPTION
48	515-0057-00		1	1	Service Panel Assy
49	535-0169-01		1	1	Bracket, Speaker Panel, Right
50	535-0169-02		1	1	Bracket, Speaker Panel, Left
51	535-0184-00		2	2	Bracket, Lock
52 *	515-0079-00		1	1	Display Board Assy
53	515-0081-00		1	1	Win Lamp Panel Assy
54	406-0431-01		1	1	Label, Ticket Dispenser DL - 1275
55	406-0431-02		1	1	Label, Ticket Dispenser DL 4-S-S
56	406-0432-00		1	1	Label, Xenon Power Pcb
57	055-0018-00		1	1	Quicksplice, 18-22 AWG
58	231-0007-02		6		#10-24 X 1", Carriage bolt
59	780-0183-00	B	1	1	Manual, Cosmo
60	395-0003-00	B	2	2	Caster, Riged **(DYNAMO CAB.)**
61	390-0002-00	B	3	3	Hinge, STANLEY 1585 **(DYNAMO CAB.)**
62	231-0015-07	C	4	24	Bolt, Tap, Hex 5/16 -18 X 1 1/4 MS
63	231-0012-05	C	6	6	Bolt, Hex, 3/8-16 X 1", MS, Tap
64	231-0011-06	C	9		Carriage Bolt, #10-24 X 1", Black

end

Released : 01-23-91
Revision A : 01-28-91
Revision B : 02-05-91
Revision C : 02-13-91

510-0208-00 BACK BOX ASSY, COSMO
Part Number Description

LIST OF MATERIALS

ITEM	PART NUMBER	REV	QTY/ASY	QTY/GM	DESCRIPTION
01	036-0243-00		1	1	Harness, J3 - J86
02	036-0247-00		1	1	Harness, J4 (to motors & resistors)
03	036-0250-01		1	1	Harness, Energy Box 1 Extension
04	036-0250-02		1	1	Harness, Energy Box 2 Extension
05	036-0250-03		1	1	Harness, Energy Box 3 Extension
06	036-0250-04		1	1	Harness, Energy Box 4 Extension
07	036-0250-05		1	1	Harness, Energy Box 5 Extension
08	036-0251-01		1	1	Harness, Character 1 Extension
09	036-0251-02		1	1	Harness, Character 2 Extension
10	036-0251-03		1	1	Harness, Character 3 Extension
11	036-0251-04		1	1	Harness, Character 4 Extension
12	036-0251-05		1	1	Harness, Character 5 Extension
13	036-0255-00		1	1	Harness, J8, (to lamps)
14	036-0259-00		1	1	Harness, Power Supply Extension
15	036-0267-00		1	1	Harness, Coin Door Lamp Extension
16	040-0003-00		20		Tywrap, 4"
17	040-0006-00		5		Clamp, Cable, Nylon
18	232-0002-00		10		Screw, PH, Phil, #8 X 1/2 SMS
19	366-0023-00		1	1	Back Box
20	366-0027-00		1	1	Side Door
21	366-0028-00		1	1	Rear Door
22	510-0205-00		1	5	Drive Unit Assy
23	535-0158-00		1	1	Bracket, Drive Unit
24	231-0014-00		13		Bolt, 1/4 - 20 X 1 1/4", Hex H.,MS
25	244-0002-00		13		Washer, Split Lock, 1/4
26	242-0016-00		13		Washer, Flat, 1/4
27	535-0159-00		1	4	Playfield Divider Panel, Middle
28	535-0160-01		1	1	Playfield Divider Panel, Right
29	535-0160-02		1	1	Playfield Divider Panel, Left
30	820-0056-00		1	4	Decal, Playfield Panel, Wide
31	820-0057-00		1	2	Decal, Playfield Panel, Narrow
32	820-0058-01		2		Decal, Side, Back Box
33	820-0058-02		2		Decal,Side, Back Box
34	820-0058-03		2		Decal, Side, Back Box
35	820-0058-04		2		Decal, Side, Back Box
36	535-0155-01		1	1	Grate, Right
37	535-0155-02		1	1	Grate, Left
38	535-0166-00		1	1	Roll Bar (U Channel)
39	535-0156-00		1	1	Energy Divider Panel
40	234-0013-02		2	2	Bolt, #10-24 X 3/4", Button Head,MS
41	535-0157-00		1	1	Cosmo Divider Panel
42	515-0030-03		1	1	ON/OFF Switch Assy

510-0208-00 BACK BOX ASSY, COSMO (Continued)
Part Number Description

ITEM	PART NUMBER	REV	QTY/ASY	QTY/GM	DESCRIPTION
43	231-0013-10		4		Bolt, Button Head,Hex, 5/16-18 X 2 1/4
44	231-0013-05		4		Bolt, Button Head,Hex, 5/16-18 X 2"
45	231-0013-04		4		Bolt, Button Head,Hex, 5/16-18 X 1 1/2"
46	242-0022-00		4		Washer, flat, 5/16
47	242-0021-00		14		Washer, Fender, Black, 5/16 X 1 1/4"
48	238-0015-00		4		Nut, Kep, 5/16-18
49	239-0010-00		18		Well Nut, #10-32
50	242-0010-00		18		Washer, Flat, #10 , Black
51	232-0014-02		18		Screw, Button Head, Hex, #10-32 X 1", MS
52	660-0012-00		1	1	Shield, Vertical
53	660-0011-01	A	1	1	Shield, Angled
54	660-0010-01	A	1	1	Shield, Top
55	535-0189-01		2	2	Bracket, Shield, Insde
56	535-0189-02		2	2	Bracket, Shield, Outside
57	234-0003-03		12		Screw, Button Head,Black #8-32 X 3/4, MS
58	242-0023-00		12		Washer, Flat, #8 , Black
59	285-0011-00		2	2	Rubber Bumper, Black, t=1/4",#SJ5018
60	231-0016-02		2	2	Bolt, But.H, 1/4-20 X 1/2"
61	395-0002-00	B	4	4	Caster, Swivel **(DYNAMO CAB.)**

end

Released : 01-23-91
Revision A : 01-25-91
Revision B : 02-05-91

510-0210-00 TOP BOX ASSY, COSMO
Part Number Description

LIST OF MATERIALS

ITEM	PART NUMBER	REV	QTY/ASY	QTY/GM	DESCRIPTION
01	036-0256-00		1	1	Harness, Lamp Extension,Top Box
02	036-0257-00		1	1	Harness, UFO Lamp (8 lamps)
03	036-0260-00		1	1	Harness, Cosmo Spot lamp (5 lamps)
04	036-0261-00		1	1	Harness, Boss Spot Lamp (3 lamps)
05	036-0269-00		1	2	Harness, Wing Lamp
06	040-0007-00		4		Clamp, Cable, Nylon, 3/8
07	366-0025-00		1	1	Title Board
08	366-0024-00		1	1	Top Box
09	366-0029-00		1	1	Access Door, Top Box
10	366-0030-00		1	1	Light Board, Top Box
10a	366-0089-00		1	1	Cosmo Boss Base, Plywood
11	800-0052-00		1	1	Overlay, Marquee
12	820-0059-00		1	1	Decal, Above Cage
13	231-0013-04		4		Bolt, Button Head, 5/16-18 X 1 1/2
14	242-0021-00		4		Washer, Fender, Black, 5/16 X 1 1/4"
15	242-0022-00		2		Washer, Flat, 5/16
16	238-0015-00		2		Nut, Kep, Hex, 5/16-18
17	545-0017-00		1	1	UFO (A)
18	545-0018-00		1	1	UFO (B)
19	232-0002-02		3		Screw, PH, #8 X 3/4, SMS
20	545-0019-00		1	1	UFO (C), Red Dome Insert
21	232-0008-02		3		Screw, PH, #8-32 X 1/2, MS
22	242-5011-00		9		Washer, Plat, #8
23	239-0002-00		3		Nut, Kep, #8-32
24	545-0020-00		1	1	Dome
25	545-0031-00		1	1	Film, Plastic, Red
26	077-5101-00		1	2	Socket (Wing Lamp)
27	545-0023-00		1	2	Lens, Red
28	232-0007-02		4		Screw, Lens, PH, #6-32 X 1/2, MS
29	239-0009-00		4		Nut, Kep, #6-32
30	535-0185-00		1	1	Bracket, Character Boss
31 *	510-0206-00		1	1	Character Boss/Atenna
32	239-0001-00		2		Nut, Kep, #10-24
33	077-0003-00		8	8	Socket, Short, Standup #89
34	165-5000-89		10		Lamp, #89, 13V
35	077-0002-00		8	8	Socket, Miniature Bayonet, straight
36	165-0008-00		8		Lamp, #1816, 13V, .33A
37	232-0003-00		20		Screw, PH., #6 X 1/2 SMS
38	810-0049-00		1	1	Back Board w/artwork (cardboard)
39	200-0024-00		1		Fuse, 2.5A, 250V, Fast Blo
40	205-0003-01		1	1	Fuse Holder, 1 position
41	233-0001-03		6		Screw, FH, #8 X 1 1/4", SMS
42	234-0013-02		5		Screw, Button Head #10-24 X 3/4
43	242-0010-00		5		Washer, Flat, #10
44	406-0002-00		1	1	Label, FCC Warning
45	406-0003-00		1	1	Label, FBI Warning
46	406-0004-00		1	1	Label, Serial Number

Released : 01-23-91

510-0211-00 POWER SUPPLY ASSY, COSMO
Part Number Description

LIST OF MATERIALS

ITEM	PART NUMBER	REV	QTY/ASY	QTY/GM	DESCRIPTION
01	036-0264-00		1	1	Harness, Power (Power Supply)
02	036-0265-00		1	1	Harness, Coin Door Lamp
03	036-0266-00		1	1	Harness, Fuse
04	036-0268-00		1	1	Harness, Power (On/ Off Sw. Side)
05	010-0011-00		1	1	Transformer, 24Vac, 12Vac, 9Vac
06	040-0003-00		5		Tywrap, 4"
07	040-0007-00		3		Clamp, Cable, Nylon, 3/8"
08	112-0054-00		1	2	Bridge Rectifier, MDA 2501
09	112-0057-00		1	1	Bridge Rectifier, MDA 3502
10	116-0021-00		1	1	Heat Sink
12	120-0001-43		1	2	Resistor, 2.2KΩ, 1/4 W
13	121-0008-00		1	1	Fixed Power Resistor, 100Ω, 50W
14	124-0001-00		1	1	Resistor Mounting Hardware (clamp)
15	125-0016-00		1	2	Capacitor, Elec.Can Style 21000,35Vdc
16	125-0019-01		1	1	Cap., Elec. Can Style, 23000μF,40Vdc
17	135-0003-00		1	3	Cap. Mounting Hardware MALLORY
18	150-0006-00		1	1	Filter, Noise
19	232-0003-00		11		Screw, Pan, #6 X 1/2 SMS
20	232-0008-07		3		Screw, #8-32 X 1 1/4, PH, MS
21	242-5011-00		3		Washer, Flat #8
22	239-0002-00		3		Nut, Kep, #8-32
23	232-0002-01		4		Screw, PH, #8 X 5/8, SMS
24	233-0001-02		4		Screw, Flat, #8 X 1" SMS
25	034-0001-00		1	1	Power Cord, 12 ft
26	280-0001-00		1	1	Strain Relief
27	535-0010-00		1	1	Strain Relief Plate
28	200-0021-00		1		Fuse, 3A, Fast Blo (8.5V)
29	200-0017-00		1		Fuse, 6A, Fast Blo (line fuse)
30	200-0018-00		1		Fuse, 6A, Slo Blo (Coin Lamp)
31	200-0012-00		1		Fuse, 8A, Fast Blo (12V)
32	200-0020-00		1		Fuse, 15A, Fast Blo (24V)
33	205-0003-05		1		Fuse Holder, 5 position
34	406-0433-00		1	1	Fuse Label
35	406-0434-00		1		Label, Caution, Power Supply
36	660-0003-00		1	1	Fish Paper, 4 X 8" (safety cover)
37	232-0004-06		4		Screw, PH, #10 X 5/8, SMS
38	366-0033-00		1	1	Power Supply Board (Plywood)
39	232-0027-01		1		Screw, PH, Phil, #8 X 3/8, self tapping

end

Released : 01-23-91

510-0205-00 DRIVE UNIT ASSY, COSMO
Part Number Description

LIST OF MATERIALS

ITEM		PART NUMBER	REV	QTY/ASY	QTY/GM	DESCRIPTION
01		036-0248-01		1	1	Harness, Sensor, Front
02		036-0248-11		1	1	Harness, Sensor, Back
03		036-0249-01		1	1	Harness, Sensor, Center
04		036-0248-02		1	1	Harness, Sensor, Front
05		036-0248-12		1	1	Harness, Sensor, Back
06		036-0249-02		1	1	Harness, Sensor, Center
07		036-0248-03		1	1	Harness, Sensor, Front
08		036-0248-13		1	1	Harness, Sensor, Back
09		036-0249-03		1	1	Harness, Sensor, Center
10		036-0248-04		1	1	Harness, Sensor, Front
11		036-0248-14		1	1	Harness, Sensor, Back
12		036-0249-04		1	1	Harness, Sensor, Center
13		036-0248-05		1	1	Harness, Sensor, Front
14		036-0248-15		1	1	Harness, Sensor, Back
15		036-0249-05		1	1	Harness, Sensor, Center
16	*	510-0204-00		1	5	Character Assy w/photo pcb
17	*	535-0175-00		1	5	Character Carrier
18	*	535-0176-00		1	5	Energy Carrier w/ sensor pcb
19	*	545-0016-00		1	5	Energy Box
20	*	080-0005-00		1	5	Motor, 5.5VDC, 1.25A
21	*	535-0177-00		1	5	Motor Bracket
22	*	121-0007-00		2	10	Ceramic Resistor, 16Ω, 30W
23	*	305-0001-00		1	5	Pulley, Big
24		535-0171-00		1	5	Rail
25	*	520-0097-00		3	15	Sensor Pcb
26		305-0002-00		1	5	Pulley(B), w/bearing, Small, SAVA MP-614
27		530-0033-00		1	5	Shaft, Small Pulley
28		254-0019-00		2	10	Spacer, Bronze,
29		250-0009-00		4	20	E-Ring
30		315-0001-00		1	5	Cable, 148", 1/32
31		232-0021-03		6	30	Screw, Pan, #4-40 X 1/4", MS
32		239-0010-00		3	15	Well Nut, #10-32 WACHTEL # G-1032
33		232-0009-06		3	15	Screw, Phil, #10-32 X 1", MS
34		232-0008-02		4	20	Screw, Phil, #8-32 X 1/2, MS
35		232-0009-02		4	20	Screw, Phil, #10-32 X 1/2, MS
36		535-0186-00		1	5	Front Stopper Bracket w/hook
37		535-0187-00		1	5	Rear Stopper Bracket
38		285-0010-00		3	15	Cushion, t=1/2"
39		535-0188-00		1	5	Bracket, Small Pulley

end

Released : 01-23-91

515-0077-00 SEAT UNIT ASSY, COSMO
Part Number Description

LIST OF MATERIALS

ITEM	PART NUMBER	REV	QTY/ASY	QTY/GM	DESCRIPTION
01	231-0001-10		8		Bolt, Hex Head, 1/4-20 X 1 3/4", MS
01a	232-0028-05	A	8		Screw,PH #10-24 X 1 3/4"**(DYNAMO CABINET)**
02	231-0012-13		2		Bolt, Hex, 3/8-16 X 2 3/4"
03	234-0003-02		16		Screw, Button Head, #8-32 X 1/2 MS
04	238-0009-00		2		Nut, Hex, 3/8
05	242-0017-00		8		Washer, Flat, Fender, ID=9/32, OD=1"
05a	242-0026-00	A	8		Washer, Flat, Fender, OD=1" **(DYNAMO)**
06	244-0008-00		2		Washer, Split Lock, 3/8
07	366-0021-00		1	2	Spacer, Particle Board
08	535-0161-00		1	1	Seat Frame
09	535-0164-00		1	2	Seat, Bottom
10	535-0170-00		1	1	Guide, Hat, Seat Frame
11	545-0021-00		1	2	Seat
12	400-0003-00		2	2	Foot Leveling, #3/8 - 16 X 1 1/2

end

Released : 01-23-91
Revision A: 02-05-91

515-0078-00 XENON LAMP ASSY, COSMO
Part Number Description

LIST OF MATERIALS

ITEM	PART NUMBER	REV	QTY/ASY	QTY/GM	DESCRIPTION
01 *	160-0006-00		1	2	Xenon Tube w/harness
02	535-0163-00		1	2	Bracket w/Xenon Clip
03	535-0179-00		1	2	Grill, Xenon Tube

end

Released : 01-23-91

515-0057-00 SERVICE PANEL ASSY, COSMO
Part Number Description

LIST OF MATERIALS

ITEM	PART NUMBER	REV	QTY/ASY	QTY/GM	DESCRIPTION
01	036-0211-01		1	1	Harness, Service Panel
02	090-0002-00		1	1	Coin Counter
03	123-0008-11		1	1	Potentiometer, 100Ω, 2W
04	180-0024-00		1	1	Pushbtn w/μsw, Black
05	180-0024-02		1	1	Pushbtn w/μsw, Red
06	232-0018-01		2	2	Screw, PH, Phil, #5 X 1/2", SMS
07	406-0096-00		1	1	Label, Volume
08	406-0287-00		1	1	Label, Test
09	535-0135-00		1	1	Bracket, Service Panel

end

Released: 01-23-90

515-0079-00 DISPLAY (SPEAKER) PANEL ASSY, COSMO
Part Number Description

LIST OF MATERIALS

ITEM		PART NUMBER	REV	QTY/ASY	QTY/GM	DESCRIPTION
01		031-0008-00		1	2	Speaker, 4.68 X 4.68, 8Ω,6W
02		036-0253-00		1	1	Harness, Speaker
03		232-0003-00		8		Screw, #6 X 1/2, Ph, SMS
04		232-0003-06	A	8		Screw, Ph, #6 X 5/8 SMS
05		232-0007-00		6		Screw, #6-32 X 1/4, PH, MS
06		239-0009-00		6		Nut, Kep, #6-32
07		366-0031-00		1	1	Display (Speaker) Panel, Wood
08	*	510-0199-00		1	1	Pcb, Display
09		535-0131-00		6		Z Bracket
10		535-0178-00		2		Speaker Grill
11		830-0053-00		1	1	Score Panel Plex
12		233-0001-05		8		Screw, FH, #8 X 5/8, SMS

end

Released : 01-23-91
Revision A: 02-15-91

515-0081-00 WIN LAMP PANEL ASSY, COSMO
Part Number Description

LIST OF MATERIALS

ITEM	PART NUMBER	REV	QTY/ASY	QTY/GM	DESCRIPTION
01	036-0252-00		1	1	Harness, Win Lamp
02	040-0001-00		3		Clamp, Cable, Stickdown
03	077-5100-00		2		Socket, Laydown
04	165-5000-89		2		Lamp, 13V, #89
05	232-0007-02		2		Screw, PH, #6-32 X 1/2", MS
06	232-0007-06	A	2		Screw, PH, #6-32 X 1 , MS
07	239-0009-00		4		Nut, #6-32
08	406-0430-00		1	1	Label, Win Lamp
09	535-0168-00		1	1	Panel, Win
10	545-0022-00		1	1	Lens, Win Lamp

end

Released : 01-23-91
Revision A: 02-15-91

515-0030-03 ON/OFF SWITCH ASSY, COSMO
Part Number Description

LIST OF MATERIALS

ITEM	PART NUMBER	REV	QTY/ASY	QTY/GM	DESCRIPTION
01	535-0082-00		1	1	Plate, Switch Mounting
02	180-0023-00		1	1	Switch, Toggle DPSP
03	036-0184-00		1	1	Harness, Switch Plate (12")

end

Released: 02-06-91

FCC WARNING

This equipment generates and uses radio frequency energy and if not installed and used properly, ie; in strict accordance with this instruction manual, may cause harmful interference to radio communications. This equipment has been tested and found to comply with the limits for a class A computing device pursuant to Subpart J of Part 15 of the FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment.

Operation of this equipment in a residential environment is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures are necessary to correct the interference.

FBI WARNING

Federal law provides severe civil and criminal penalties for the unauthorized reproduction, distribution, or exhibition of copyrighted audio-visual works and video games. The Federal Bureau of Investigation investigates allegations of criminal copyright infringement.

COPYRIGHT NOTICE

COSMOGANG™ is Copyright 1990, DATA EAST USA, INC., Designed by NAMCO, manufactured by DATA EAST USA, INC., sold exclusively in the United States of America and Canada by DATA EAST USA, INC. All rights reserved.

ENVIRONMENTAL DATA

This product is intended for indoor use only! Power requirements are 105 - 125 volts AC, 50 - 60 Hz. This equipment requires a three (3) wire grounded outlet.

SERVICE PROCEDURES

To obtain replacement parts and technical service, contact the authorized Data East Distributor in your area. If you require referral or further technical assistance, you may contact Data East's Customer Service Department during the hours of 8:00 AM to 5:00 PM, Pacific Time, at (408) 286-708, or outside of California at (800) 634-7270.